



CHIPPEWA NATIONAL

FOREST

FISCAL YEAR 2007

MONITORING AND EVALUATION REPORT

CHIPPEWA NATIONAL FOREST
Land and Resource
Management Plan

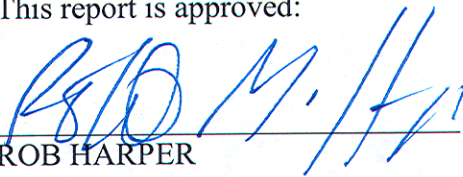
2008

FISCAL YEAR 2007 MONITORING AND EVALUATION REPORT

APPROVAL AND DECLARATION OF INTENT

I have reviewed the FY 2007 Monitoring and Evaluation Report for the Chippewa National Forest that was prepared during the winter of 2007 and 2008. I am satisfied with the findings and intend to consider recommendations made during project development and plan revision. The Monitoring and Evaluation Report meets the intent of both the Forest Plan (Chapter IV) as well as the 2000 Planning Rule.

This report is approved:


ROB HARPER
Forest Supervisor


Date

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EXECUTIVE SUMMARY

FISCAL YEAR 2007 MONITORING & EVALUATION REPORT

Chippewa National Forest

This is the third Monitoring and Evaluation Report compiled under the 2004 Chippewa National Forest Plan. The plan was signed by Regional Forester, Randy Moore, on July 30, 2004. Our Monitoring and Evaluation plan is described in Chapter IV of the Forest Plan. As explained in detail in Chapter IV, monitoring items consist of mandatory components you will find in every forest plan as well monitoring items that are tailored to address issues raised through public scoping and interdisciplinary team review.

After signing the Forest Plan, the Monitoring Implementation Guide was developed. The Monitoring Implementation Guide provides specific technical guidance that describes how, where, and when to accomplish the monitoring prescribed in the forest plan. It provides specific methods, protocols and analytical procedures. The Monitoring Implementation Guide establishes and schedules the priorities and should ensure efficient use of limited time, money and personnel. The guide is intended to be flexible and could be modified in response to new information, updated procedures or protocols, emerging issues, and budgetary considerations without amending the forest plan.

Monitoring and Evaluation Report

The information gained from the Monitoring and Evaluation Report is used to determine how well the desired conditions, goals, objectives, and outcomes of the forest plan have been met. However, at this point, three years after implementation of the revised Forest Plan, trends, patterns, and results generally are not clearly defined. Evaluations and conclusions that would lead to changes in the Forest Plan are not expected. Rather, this report focuses more on what we monitored, how it was monitored, how easy and efficient the protocols were to use, and how effective they were at answering the monitoring questions.

Highlights from the Report

- The forest continues to work with the Leech Lake Band of Ojibwe to strengthen relationships, partnerships, cultural awareness, employment and to increase species diversity on the landscape.
- Timber target increased from 28,900 MBF in FY 2006 to 37,163 MBF (an increase of approximately 29%) in FY 2007. The actual volume offered and sold in FY 2007 increased from 28,929 MBF in FY 2006 to 37,557 MBF (approximately 30%).
- Given the current rate of thinning, clearcutting, and uneven-aged management, some shifts will need to be made in timber harvest planning and implementation treatments to meet the decadal Forest Plan objectives.
- The Wildlife, Fisheries and Rare Plant program is implementing projects at a level consistent with that proposed in the Forest Plan for aquatic and terrestrial habitat enhancement and restoration. Many of these projects are accomplished through

partnerships. Sensitive plant habitat restoration projects are underway. There is an administrative study underway for Goblin Fern. A five year monitoring program (conducted by a contractor) for Goblin Fern along the Enbridge pipeline was completed in FY 2007 that looked at the success of transplanting goblin ferns. A partnership to ensure that a population of several thousand Showy Lady's Slippers, the state flower of Minnesota, located along Hwy 39, are not irreparably damaged or eliminated during the highway upgrade. Plans are underway to transplant the flowers. A recent project on the Walker District also included plans to plant Canada yew in 2008.

- Dragonfly, damselfly and longear sunfish surveys were conducted on the forest. Findings still need to be summarized and shared.
- Many programs have experienced a steady decline in their annual budgets. Full implementation of the Forest Plan is a challenge when required to do more with fewer dollars.
- Off-Highway Vehicle Road Travel Access planning was completed in November 2007. The Motor Vehicle Use Map will be available in 2008. Concerted efforts will be made to increase public awareness and to collaborate with other law enforcement units for more effective road closures.
- The most effective road closures are rock berms, gates and vegetation. The use of earthen berms for road closures should be largely discontinued.
- Generally, harvested lands are adequately restocked. Drought, deer predation and delays in burning for site preparation have contributed to difficulties in getting adequate stocking within the five year timeframe.
- An evaluation of insect and disease trends did not indicate increases in populations that warranted management concern or actions. Vigilance in monitoring is warranted with the pending threat of both gypsy moth and emerald ash borer.
- Fire monitoring focused on effects of harvest and proposed prescribed fire on blueberry plants in the Sand Plains area. Burning has not been implemented due to droughty conditions. Based on data collected on the unburned plots, it appears that without fire, objectives for increased blueberry production may not be met. Monitoring should continue for at least two years after burning is complete. Additional information on blueberry production is presented in the Research and Studies section under the Red Pine Retention Study.
- Low nutrient soils were monitored for slash retention. Biomass removal was done on one site and appears to be inconsistent with Forest Plan direction.
- Wetland restoration, road obliteration, and riparian planting have improved overall watershed conditions. Monitoring of wetland restoration and road obliteration indicates these specific projects accomplished their objectives. Monitoring of BMPs in harvest units showed that BMPs were being met. Riparian plantings were efficient and designed to enhance/improve riparian conditions.
- And finally, BMP monitoring of application and effectiveness in several cutting units on the Walker District indicates that harvest activities, sale design features, and mitigation measures identified and planned in EA are being implemented. Sometimes complications result during implementation and harvesting that make it inefficient and/or uneconomical to meet objectives. Better communication between planning and implement teams will facilitate understanding. Road closures from slash or root placement were effective.

Additionally, funding to accomplish post harvest activities, such as diversity planting, isn't always available.

- There are a number of studies and research projects on the forest. An elm restoration project is the most recent addition. Ongoing are the Goblin Fern administrative study, red pine retention study, long-term soil productivity study, soil compaction study, and revegetation monitoring.

Forest Plan Summit

The Forest held a Vegetation Management Forest Plan Summit to discuss implementation of our Forest Plan. Objectives of the one day forest-wide meeting was to gain a common understanding of the wide array of activities implementable under the new Forest Plan, and to lay a common groundwork for project expectations consistent with the FP. Topics focused on hurdles to full implementation of the plan, identification of efficiencies and inefficiencies to NFMA and NEPA, increasing the time between project re-entry periods, and opportunities and options for forest conversions. The summit was attended by line officers, some team leaders, IDT members and resource specialists from across the forest.

Activity Review

Employees interested in reviewing a couple of timber sales on the Walker district met to spend a day in the field looking at several recently harvested units. The intent of the day was to evaluate whether what we said in the environmental assessments matched what was implemented on the ground. Employees considered and evaluated if planning direction and mitigation for wildlife, soils, silviculture, and riparian were implemented as planned and if treatments were effective.

Other Project Monitoring

Monitoring of projects, large and small, occurs on all the districts and involves numerous resource professionals across the forest. Examples include sale administrators checking for compliance; field checking of timber marking to meet prescription objectives; conducting regeneration surveys to determine stocking levels, checking to determine if harvest units incorporate and reflect the silvicultural prescriptions and EA direction, checking application of mitigation measures to determine if they are appropriate and effective. Often times the monitoring is informal consisting of general field observations. Other times monitoring is more formal and entails following protocols; the results are generally included in the monitoring and evaluation reports.

Public Involvement

We continue to publish the *Chippewa National Forest Quarterly*, a schedule of proposed actions and decisions that implement the Forest Plan. We encourage the public to become part of our management process by commenting on project proposals through the NEPA process. Information about planning our projects and project contacts can be found on the Internet at [www.fs.fed.us/r9/forests/chippewa/projects & plans](http://www.fs.fed.us/r9/forests/chippewa/projects&plans).

MONITORING & EVALUATION REPORT

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MONITORING & EVALUATION REPORT

I. INTRODUCTION

This is the third Monitoring and Evaluation Report compiled under the 2004 Chippewa National Forest Plan. The plan was signed by Regional Forester, Randy Moore, on July 30, 2004. Our Monitoring and Evaluation plan is described in Chapter IV of the Forest Plan. As explained in more detail in Chapter IV, monitoring items consist of mandatory components you will find in every forest plan as well as items that are tailored to address issues raised through public scoping and interdisciplinary team review.

The annual monitoring and evaluation report (M and E) provides an opportunity to track progress towards the implementation of revised forest plan decisions and the effectiveness of specific management practices. The focus of the evaluation is in providing short and long term guidance to ongoing management. The M and E report should include components such as:

- (1) Forest accomplishments toward desired conditions and outputs of goods and services.
- (2) Forest Plan Amendment Status.
- (3) Status of other agency/institution cooperative monitoring.
- (4) Summary of available information on MIS or comparable species.
- (5) Summary of large scale or significant projects or programs.
- (6) Update of research needs
- (7) Public participation/disclosure plan

Chapter II consists of monitoring for elements from the Monitoring Matrix of the Forest Plan tied to specific resource areas. Each of these includes some background information, a brief explanation of the monitoring activities and protocol used, and discussion on the evaluation or conclusions when feasible.

Chapter III provides a brief summary of on-going research and studies on the Forest.

Chapter IV addresses adjustments or corrections to the Forest Plan.

Chapter V is a list of the Forest Service employees that provided information contained in this report.

II. DISCUSSION OF MONITORING

The following table consists of elements from the Monitoring Matrix, Table MON-4 of the Forest Plan. It identifies the resource element, the monitoring question, drivers, and frequency of measure that are discussed on the pages that follow in this report.

Table 1: Resource areas, monitoring questions drivers, and measure frequency discussed in this report.

Resource	Monitoring Question(s)	Driver (Applicable CFR's, FP Desired Conditions, and FP Objectives)	Measure Frequency
Tribal Rights and Interests	Is Forest management helping to sustain American Indians' way of life, cultural integrity, social cohesion, and economic well being?	D-TR-1. O-TR-1. O-TR-3.	Throughout the year
Tribal Rights and Interests	Are government to government relationships functional?	D-TR-2. O-TR-2. O-TR-4.	Throughout the year
Tribal Rights and Interests	Is the Forest facilitating the right of the Tribes to hunt, fish, and gather as retained via treaty?	D-TR-3.	Throughout the year
Social & Economic Stability	To what extent does output levels and location of timber harvest and mix of saw timber and pulpwood compare to those levels projected?	CFR 219.19.12(k)[1]. A quantitative estimate of performance comparing outputs and services with those projected by the forest plan;. 36CFR 219.7(f).A program of monitoring and evaluation shall be conducted that includes consideration of the effects of National Forest Management on land, resources, and communities adjacent to or near the National Forest being planned and the effects upon National Forest management from activities on nearby lands managed by other Federal or other government agencies or under the jurisdiction of local governments. D-TM-1, O-TM-1	Annual
All	How close are projected outputs and services to actual?	(36 CFR 219.12(k)[1]. A quantitative estimate of performance comparing outputs and services with those projected by the forest plan;	Annual
All	How close are projected costs with actual costs?	(36 CFR 219.12(k) [3]. Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the forest plan.	Annual

Recreation Motor Vehicles	To what extent is the Forest providing OHV opportunities; what are the effects of OHV's on the physical and social environment; and how effective are forest management practices in managing OHV use?	36 CFR 219.21[g]. Off-road vehicle use shall be planned and implemented to protect land and other resources, promote public safety, and minimize conflicts with other uses of the National Forest System lands. Forest planning shall evaluate the potential effects of vehicle use off roads and, on the basis of the requirements of 36 CFR 295 part of this chapter, classify areas and trails of National Forest System lands as to whether or not off-road vehicle use may be permitted. D-RMV-1, 2. O-RMV-1, 2.	Annual
Wildlife: TES	To what extent are road and trails closures effective in prohibiting unauthorized motor vehicle use?	G-WL-7, G-RMV-4, O-TS-3, O-TS-7, S-TS-3, S-TS-7, and G-TS-12 , G-TS-16	1-5 years
Wildlife: Management Indicator Species	What are the population trends of management indicator species? Gray Wolf Eagle Goshawk White Pine	36 CFR 219.19(a)(6). Population trends of the management indicator species will be monitored and relationships to habitat changes determined. This monitoring will be done in cooperation with state fish and wildlife agencies, to the extent practicable. O-WL-1, O-WL-15, O-WL-16, O-WL-32. O-WL-33.	Annual
Timber	Are harvested lands adequately restocked after five years?	(36 CFR 219.12(k)[5][i]. Lands are adequately restocked as specified in the forest plan	Annual
Insects & Disease	Are insects and diseases populations compatible with objectives for restoring or maintaining healthy forest conditions?	(36 CFR 219.12(k)[5][iv]. Destructive insects and disease organisms do not increase to potentially damaging levels following management activities. D-ID-3, O-ID-1, D-VG-5, D-VG-8, O-VG-11-13	Annual
Fire	How, where, and to what extent will prescribed fire be used to maintain desired fuel levels, and/or mimic natural processes, and/or maintain/ improve vegetation conditions, and/or restore natural processes and functions to ecosystems?	D-ID-4-5, O-ID-2-4	1-5 years
Soils	Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?	36 CFR 219.12 (k) [2], Documentation of the measured prescriptions and effects, including significant changes in productivity of the land; D-WS-3, D-WS-12, O-WS-9,	1-5 years

		O-WS-10	
Watershed Health & Riparian-	To what extent is Forest management affecting water quality, quantity, flow timing and the physical features of aquatic, riparian, or wetland ecosystems?	All WS Desired Conditions and Objectives with the possible exception of D-WS-14, plus O-RWA-1 D-PH-3, D-PH-4, O-PH-3, O-TS-4 and O-TS-5	1-5 years
All	Monitoring and evaluation requirements will provide a basis for a periodic determination of the effects of management practices. 36 CFR 219.11(d) At intervals established in the plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied. Based upon this evaluation, the interdisciplinary team shall recommend to the Forest Supervisor such changes in management direction, revision, or amendments to the forest plan as are deemed necessary. (36 CFR 219.12(k))	Monitoring Regulatory Requirement, Table MON-1, Forest Plan, p 4-3. (Includes BMP monitoring)	

1. Tribal Rights and Interests

Monitoring Questions:

- Is Forest management helping to sustain American Indians' way of life, cultural integrity, social cohesion, and economic well being?
- Are government to government relationships functional?
- Is the Forest facilitating the right of the Tribe to hunt, fish, and gather as retained via treaty?

Monitoring Driver:

D-TR-1 Lands within the Forest serve to help sustain American Indians' way of life, cultural integrity, social cohesion, and economic well-being.

D-TR-2 The Forest Service continues to work within the context of a respectful government-to-government relationship with Tribes, especially in areas of treaty interest, rights, traditional and cultural resources, and ecosystem integrity. The Forests provide opportunities for traditional American Indian land uses and resources.

D-TR-3 The Chippewa National Forest facilitates the exercise of the right to hunt, fish, and gather as retained by Ojibwe whose homelands were subject to treaty in 1855 (10 Stat. 1165). Ongoing opportunities for such use and constraints necessary for resource protection are reviewed and determined in consultation with the Leech Lake Band of Ojibwe.

O-TR-1 Improve relationships with American Indian tribes in order to understand and incorporate tribal cultural resources, values, needs, interests, and expectations in forest management and develop and maintain cooperative partnership projects where there are shared goals.

O-TR-2 Maintain a consistent and mutually acceptable approach to government-to-government consultation that provides for effective Tribal participation and facilitates the integration of tribal interests and concerns into the decision-making process.

O-TR-3 The Forest Service will work with the appropriate tribal governments to clarify questions regarding the use and protection of miscellaneous forest products with the objective of planning for and allowing the continued free personal use of these products by band members within the sustainable limits of the resources.

O-TR-4 Consult, as provided for by law, with Tribes in order to address tribal issues of interest and National Forest management activities and site-specific proposals.

Background:

The Chippewa NF is located on land subject to treaty between the U.S. and the Ojibwe in 1855. The affected Ojibwe include the Leech Lake Band. The treaty and subsequent treaties, executive orders, and laws established the present boundaries of the Leech Lake Reservation. Most of the reservation overlaps the external boundaries of the Chippewa NF and jurisdiction is mixed

among many landowners including the Forest and the Band. The Forest boundary now encompasses about 1.6 million acres, with approximately 660,000 acres managed by the Chippewa National Forest. Approximately 44% of the Chippewa NF land is within the Leech Lake Reservation boundary.

The Ojibwe interest in the Chippewa National Forest goes beyond that of spiritual and cultural to the unique legal relationship that the United States government has with tribal governments. These federally recognized tribes have a sovereign status above that of State government. The federal relationship with each tribe was established by, and has been addressed through, the Constitution of the United States, treaties, executive orders, statutes, and court decisions. The federal trust doctrine requires that federal agencies manage the lands under their stewardship with full consideration of tribal rights and interests, particularly reserved rights, where they exist. The treaties also preserved the right of the Leech Lake Band of Ojibwe (LLBO) to hunt, fish, and gather within the treaty area. This guarantee is important in the context of natural resource management. The Chippewa National Forest has a role in maintaining these rights because they are offices of the federal government responsible for natural resource management on lands subject to these treaties.

The continued availability of traditionally utilized natural resources is crucial to the Ojibwe. Now, as in the past, many places throughout the landscape are visited during a yearly cycle to collect food, medicines, and other materials, as well as for religious practices and social gatherings. Plants and animals gathered from prairie openings, aquatic environments, and forests, provide sustenance. The traditions of gathering these and other natural resources continue to be economically and spiritually important. Because of their concern with the continuation of this aspect of Ojibwe culture, the Band takes an active role in the protection and restoration of many species of plants, animals, and fish. The Band also claims that access to these resources and traditional cultural places is an inherent right.

There are numerous areas throughout the Forest that have traditional, cultural, and spiritual significance to the Ojibwe. The use and protection of these areas is a way of maintaining traditional links to past generations. Traditional use areas often have some aspect of spiritual significance. The Band believes that archeological sites and past cemetery areas, many of which are unplatted, are sacred and should be protected.

The Forest Plan management direction generally assures the availability of resources to support the continued exercise of treaty rights and cultural practices and not impair access to such resources and places of traditional practices. Specific availability of resources and access considerations may be determined through government-to-government consultation with the objective of maintaining sufficient availability of resources for the continued harvest or utilization needed to satisfy tribal needs. Trends in species viability, trends in watershed conditions, and changes in access to traditional places are important considerations.

The Forest and the Band have had a history of cooperation and disagreement on forest management issues. The LLBO appealed the 2004 Revised Forest Plan through the formal administrative appeals process. The appeal stated their objections to fundamental aspects of the 2004 Forest Plan. The Appeal Decision determined that LLBO was appropriately consulted throughout the planning process, that the Forest Plan contains provisions that ensure the Forest

continue to meet all treaty obligations and trust responsibilities, such as requiring the Forest to consult with tribal governments and consider traditional cultural practices in project decisions. (Chippewa National Forest, Appeal Decision, August 2005). Although the Forest is attempting to follow Forest Plan direction in the area of Tribal Rights and Interests, on subsequent Forest projects, similar comments and appeal points have been raised by LLBO. Although disagreements on forest management continue to exist, both the Forest and the Band also continue to consult on projects and engage in cooperative actions.

The bases for government-to-government consultation and cooperation have been established by previous actions by LLBO and the Forest Service. A 1993 Memorandum of Understanding (MOU) between the Forest and the Band endorses the goal of cooperation and forming management partnerships together. The 2004 Forest Plan directs implementation of the MOU by providing goals, objectives, standards and guidelines on consultation and interaction between the Forest and the Band.

Tribal Resolution 00-80 authorizes the Director of Leech Lake Division of Resource Management to be the official representative and primary contact in all US Forest Service matters. In a letter to the Band in 2003, Under Secretary for Natural Resources Mark Rey committed the Forest Supervisor to be the point of contact for government--to--government relations in lieu of a designated Tribal Liaison.

Tribal Rights and Interests were not specifically addressed or monitored under the 1986 Forest Plan. This is a new element that was incorporated into the 2004 Forest Plan.

Monitoring Activities:

There is not a well established protocol on what or how to monitor tribal rights and interests to determine if the Forest Plan desired conditions and objectives are being met. At this time, an effort is being made to track activities and commitments made that contribute towards the tribe's way of life, cultural awareness, or economic well being. In addition, we have tried to identify and track the consultation activities and cooperative activities that occur between the Band and the Forest. A database is not established or used to store and track these activities. During FY 2007, the Chippewa conducted the following activities.

Table 2: List of activities conducted in FY 2007 by the CNF related to tribal rights and interests.

Activity	Subject
<p>Contacts with Division of Resource Management and Local Indian Councils (13 exist):</p> <ul style="list-style-type: none"> ▪ to discuss project planning and current project implementation efforts and identify concerns, and ▪ to identify any historic sites or traditional uses within the project areas. <p>The project leaders met with LICs at least 18 times with regard to the following projects: Steamboat, Marcell Northeast, Portage, OHV routes, and recreation residences. These were the larger projects on the forest completed in FY 2007. In addition there were 1-2 meetings per project with THPO and DRM.</p> <p>Discussion via phone with THPO and the DRM Wildlife Biologist occurred after publication of each <i>NEPA Quarterly</i> (published quarterly). This publication lists</p>	<p>Relationships Cultural input</p>

all the ongoing and upcoming projects on the forest. This has been an effective way to determine if there are any concerns and to assess the need for further discussion, information, or meetings-- particularly on smaller projects.	
Forest Supervisor, Rob Harper, met with Division of Resource Management Director, Rich Robinson, and/or Chairman George Goggleye, Jr. at least seven times throughout the year. This exceeds the initial goal of meetings on a quarterly basis. This does not include the meetings that were scheduled and cancelled on a number of occasions.	Relationships
A Tribal Liaison position developed in cooperation with the LLBO was filled. Neil Peterson, a CNF employee will spend 40% of his time in that position. The liaison position is designed to focus on outreach and recruitment for employment, mutual cultural awareness, initiating development of a Memorandum of Understanding, and partnership building with LLBO.	Cultural Awareness Partnership
The Forest has the following Agreements in place with the LLBO: Cass Lake Ranger Station Maintenance, Impoundment Maintenance, Boy River Prescribed Burn, Archeological Surveys, Illegal Dumps Clean-up, and Noxious Weeds. There is also in place an Agreement with the Leech Lake Tribal College for the Camp Rabideau Restoration. With the Bureau of Indian Affairs (BIA) there are agreements in place for wildland fire protection, prescribed burning, and Minnesota Interagency Fire Center (MIFC).	Employment Partnerships
Beginning in 1986, the Forest helped train Leech Lake Band of Ojibwe staff to conduct formal archeological surveys. The Forest continues to contract that work with the Leech Lake Heritage Sites Program through a Participating Agreement with a 65%-35% cost share. The total value of the 2007 PA was \$147,085.	Employment Cultural
A Traditional Cultural Resources and Properties workshop was held in February 2007 to help interdisciplinary teams use a database of traditional resource information. A protocol was developed and implemented that facilitate communication with Local Indian Councils, and 106 consultation.	Cultural Awareness
In March 2007, CNF worked with LLBO and BIA to identify FS roads for inclusion in the Indian Reservation Roads inventory (IRR). The IRR program is the tribal equivalent of the Federal Highways program and has excellent potential for new cooperation, maintenance and improvement of FS roads.	Employment Partnership
In April 2007, approximately 930 acres of the Boy River Prescribed Burn project (a 6000 acre complex) was completed with the cooperation of several partners, including LLBO. In January 2008, it was announced that the Boy River Prescribed Burn partnership has received the National Wings Across the Americas "Habitat and Partnership" award for their conservation efforts with the yellow rail. Partners include the Chippewa National Forest, Leech Lake Division of Resource Management, Cass County, two DNR Regions, and multiple private partners. The award recognizes outstanding bird conservation efforts by Forest Service employees and partners. The Boy River partnership began in 2001, and was implemented beginning in 2004 with the first prescribed burn in the Boy River area with the specific objective of habitat improvement for yellow rail. Spring 2008 will mark the 5th year of the Boy River prescribed burn, and is a notable point in the monitoring process to show success of the rail project.	Employment Partnership
In May 2007, the Minnesota Conservation Award was presented to the CNF for acquisition of the former Cedar Springs Resort property on Leech Lake. Partners, including LLBO, were also recognized for their efforts to bring this property into public ownership to benefit aquatic resources.	Restoration Partnership
Employee Heritage Day, June 2007, included Leech Lake Chairman George Goggleye, Jr., Cass Lake Mayor Wayne LaDuke, Ojibwe drummers and dancers. The day was developed to help employees explore the cultural diversity of the community around the forest, the diversity of its employees, and the cultural history that helped shape the area we now call the Chippewa National Forest.	Cultural Awareness
"Little Pinky" Stewardship project between Blackduck District & LLBO was	Employment

awarded in August 2007. The project will use funds generated from a timber harvest to reforest 7 permanent openings in 2008 (14 ac).	
Lydick Stewardship project was approved August 2007. Regeneration jack pine will promote undergrowth such as blueberry, a traditional use plant important to the LLBO.	Cultural Species diversity
During summer 2007, four youth from the Leech Lake Reservation participated in the YCC program (Youth Conservation Corps) at Deer River and Walker. Two members of the LLBO also worked on fire crews at the Walker and Blackduck Districts.	Employment Training
The Forest Service, Minnesota Conservation Corps, Lady Slipper Scenic Byway Association, and the Red Lake Band of Chippewa Indians are cooperating to initiate a pilot conservation-based language immersion camp located at Rabideau CCC National Historic Landmark on the Blackduck Ranger District in the summer of 2008. The Red Lake Tribal Council has as one of its highest priorities the well-being, health and future of its children and families. The Red Lake Department of Family and Children's services has been mandated to develop and implement programs and services for the safety, well-being and positive development of Red Lake children and families. Young people will have a place to go to simultaneously gain work experience, earn an educational stipend, learn about the natural environment of which they are a part, or reconnect with cultural and family activities.	Environmental & Cultural Awareness Training Employment
In fall of 2007, the CNF hosted Susan Johnson-- R2 Tribal Relations Program Manager. Susan's visit was to help the CNF and LLBO better understand the Tribal Forest Protection Act, and Stewardship Contracting as one tool for establishing long term economic/employment opportunities for the Band. The meeting helped the Forest and LLBO to better understand the capacity of the Band to launch into a forest based economic venture under authorities of the Tribal Forest Protection Act. There was consensus more discussion needs to occur as to what Forest projects would serve the Band's interests. It was also evident that the questions about tribal capacity would need further exploration before the Band can develop a solid proposal.	Economic Development and Partnerships
Implementation began in October 2007 of a Forest-Tribal agreement to cooperatively clean up illegal dump sites in key riparian areas on the CNF using the skills of the Leech Lake Public Works Department and CNF Soil/Water expertise. In August 07 this partnership was highlighted in a presentation by the Tribal Liaison at the Minnesota Tribal Conference.	Restoration Partnership
The CNF co-sponsored a Tribal Relations Training with the Huron Manistee National Forest. Attendees included the Forest Supervisor and Deer River District Ranger.	Cultural Awareness
Training and information on Treaty Rights and Trust Responsibilities was conducted for the Forest Leadership Team in December 2007.	Cultural Awareness
Seed Collection-- The CNF has contracted with the Leech Lake Band of Ojibwe for native woody seed collection to increase their seed bank for woody species. In 2007, the Tribe collected 247 pounds of June berries, 339 pounds of pin cherries, 304 pounds of Hawthorne fruit, 9 pounds of American mountain ash and 7.5 bushels of eastern larch cones. The CNF also purchased winery "mash" in 2007 that consisted of 189 pounds of black chokeberries, 249 pounds of highbush cranberries, and 342 pounds of chokecherries. These various berries were gathered by tribal members, sold to the winery, and then sold by the winery to the Forest Service after the juice was extracted. In 2006, the Tribe collected two pounds of hawthorn fruit, 25 bushels of eastern larch cones, 5 ½ bushels of mixed acorns and 11 ¼ bushels of northern white cedar cones.	Cultural Species Diversity Employment
CNF seedling order (1/2008) for FY 2008 includes 1300 cranberry, 500 mountain ash, 5000 white cedar, 1000 hawthorn, 1,000 plum, 500 Canada yew seedlings, for an estimated total of 9,300 seedlings. Anticipated order for FY 2009 and	Species diversity Restoration

2010 is for 17,000-19,000 seedlings that include cranberry, mountain ash, white cedar, hawthorn, plum, various cherries, Juneberry, and Canada yew.	
Planting White Cedar in wildlife openings; planting of Canada yew is planned (Portage Lake DN pg 5).	Cultural Species Diversity
An American Elm Restoration Project is currently being planned to restore tolerant species to the land. LLBO is one of the partners.	Species Diversity Restoration Cultural Partnership
Forest representatives participated in the Leech Lake Career fair held annually at the Northern Lights Casino. Emphasis was placed on awareness of student employment and Youth Conservation Corp seasonal employment opportunities.	Outreach Employment
In FY-07 the Tribal Liaison assisted in facilitating consultation with Tribes on the agency's Sacred Sites policy & Special Forest Products and Forest Botanical Products Proposed Rule.	Consultation
Some new mitigation measures were developed for vegetation management projects to assist birch bark, balsam bough, and firewood gatherers. We will identify stands, provide maps to Local Indian Communities (LICs) and THPO (Gina Lemon), and publish information in the tribal newspaper, <i>The DeBahJiMon</i> .	Employment
Efforts and concerns with regard to blueberry enhancement and crops are discussed in the Fire and Studies section of the Monitoring & Evaluation Report.	Cultural

Appeal of Steamboat Resource Management Project:

The DRM and Oak Point LIC of the LLBO appealed the Steamboat Resource Management Project Environmental Assessment and Decision Notice. The Decision Notice was signed on September 12, 2007. Nine main issues were raised in their appeal. The tribe alleged that the Forest failed to meet the Forest Plan Desired Conditions, Objectives, Standards and Guidelines identified in the Tribal Right and Interests section (pp 2-35 and 2-36). Briefly, the appeal points were:

1. Environmentally Sustainable Commodity Opportunities.
2. Environmentally Sustainable Non-Commodity Opportunities
3. Cultural Values/Aesthetic Qualities
4. Accessibility Opportunities for Traditional American Indian land Uses and Resources
5. Disclosure of Environmental Effects on Cultural Properties
6. Tribal Relations/Consultation
7. Religious Beliefs and Practices
8. Cultural Awareness, Sensitivity, and Tribal Issues
9. Plant and Animal Species, Traditional Use

The project alternatives and project record showed that the Steamboat Project was in accordance with the Forest Plan. However, the trade-offs and environmental effects of additional stands on Oak Point that were added to the selected alternative were not clearly analyzed and disclosed. As a result, harvest in six stands on Oak Point was dropped.

Evaluation and Conclusions:

During FY 2007, records of interactions with tribal government provided background and feedback that allowed Chippewa National Forest to better assess if the indicators measure how well we are sustaining and facilitating relationships, rights and American Indian well-being. Progress was made on commitments from FY 2005 and FY 2006. The Chippewa NF created and filled a Tribal Liaison position in FY 2007. A Program of Work was established in cooperation with the Band. Work on a Memorandum of Understanding is in progress. A wide variety of cooperative activities and consultation efforts have been implemented. Each of these items helps establish mutual measures and expectations in support of resource management, opportunities for partnering to accomplish Forest Plan objectives, and strengthen government--to--government relations. Further recommendations include:

- Continue steps to draft Memorandum of Understand with the LLBO to help guide working relationships and define a more consistent manner for working together.
- Conduct analysis of amount of FS contracts awarded to small and disadvantaged & Tribal businesses with goal of increasing this to help promote and support local economy.
- Develop participating agreement with the Leech Lake Tribal College, that provides Science, Technology, Engineering and Math (STEM) program participants greater exposure and practical training in the Forest Service.
- Continue consultation with the LLBO and Forest Staff Specialists on the status of the Section 106 Programmatic Agreement with the goals of obtaining a signed agreement in FY 08.
- Continue efforts that facilitate greater involvement of all Tribal members in FS programs and activities afforded the general public.
- Explore establishment of a LLBO Liaison that would work with the Forest Service and other agencies. To accomplish this would require finding a funding source to cover costs associated with the position.
- Continue connecting key leaders from both governments to help address key issues that may have potential to disrupt relations. Continue to develop relationships and partnerships with LLBO. Turnover in personnel in key positions within the Forest Service and LLBO often hinders our abilities to develop common ground, shared goals in specific areas, and opportunities to move forward. Relationships and trust often need to be re-established as a result of personnel changes.

2. Social & Economic Stability

Monitoring Question:

To what extent does output levels and location of timber harvest and mix of sawtimber and pulpwood compare to those levels projected?

Monitoring Driver:

D-TM-1 The amount of commercial timber sales available for purchaser is at a level that is sustainable over time. Mill operation in northern Minnesota can depend on a consistent level of timber harvest on the National Forest.

O-TM-1 Provide commercial wood for mills in northern Minnesota. Harvested material supplies sawmills, veneer mills, paper mills and mills constructing engineered wood products (hardboard, particleboard, oriented strandboard, etc.). The Forest provides posts, poles and logs for log home construction.

Background:

This information was compiled from actual sales that were offered during Fiscal Year (FY) 2007 and is a reflection of the forest's ability to satisfy local demand for wood products.

Monitoring Activities:

Types of information monitored include the amount of volume offered, amount of volume harvested, amount of uncut volume under contract, and the number of acres offered. The volume offered is further broken down into sawtimber and pulpwood. The amount of volume offered is negotiated with the regional office each year and is more a reflection of the budget than the capability of the land. Information provided below is from the FY 2007 Annual Bid Monitoring Report and the Timber Cut and Sold Report (Timber Sale Statements of Account (TSA)).

Evaluation and Conclusions:

Table 3. Timber Target, Volume Offered & Sold, Volume Harvested, and Uncut Volume under contract, and acres offered by FY.

	FY 2007	FY 2006	FY 2005
Timber Target	37,163 MBF	28,900 MBF	27,000 MBF
Volume Offered & Sold ¹	37,557 MBF	28,929 MBF	27,184 MBF
Volume Harvested	21.4 MMBF	20.6 MMBF	26.8 MMBF
Uncut volume under contract	68.8 MMBF	53.1 MMBF	43.2 MMBF
Acres offered	5500	3523	3868

¹ FY 2006 & 2007 target was for volume sold; FY 2005 target was for volume offered.

FY 2007 was the third full reporting year under the 2004 Revised Forest Plan. In FY 2006 & 2007 the assigned forest target was based on the volume offered to the public and sold. This is a slight change from FY 2005 where target credit was based on sales offered rather than sold. The target assigned in FY 2007 increased from 28,900 MBF in FY 2006 to 37,163 MBF (approximately 29%). The actual volume offered and sold in FY 2007 increased from 28,929 MBF in FY 2006 to 37,557 MBF (approximately 30%).

The increase in target and volume sold in FY 2007 was a result of a one-time earmark from Congress which increased funding at midyear for three Lake States National Forests. The downturn of the forest products industry in Northern Minnesota focused attention on product delivery from the Chippewa National Forest. Continuing to put wood on the market became extremely important due to the shutdown of OSB mills in Northern Minnesota in the fall 2006. The Forest committed to four actions as part of a MN Governor's Task Force on Timber Industry Competitiveness:

- Adjusted advertised rates downward
- Reoffering sales that received no bids during FY 2006
- Meeting our offer/sell commitments for FY 2007
- Providing additional contract time based on the Substantial Overriding Public Interest (SOPI) Contract Extension.

It is anticipated over the next few years that targets will remain stable at a level close to that in FY 2006. Uncut volume under contract increased in FY 2007 for a third year in a row. Volume harvested levels increased slightly in FY 2007 from the amount harvested in FY 2006 but is still below what has traditionally been harvested in the years prior to 2006. In 2007 markets for housing materials (oriented strand board and lumber) continued to be depressed due to the slump in the housing market. Mills continued with periodic temporary shutdowns and prices paid for delivered material were less than what loggers had paid for stumpage. In addition, in November 2006, the Assistant Secretary of Agriculture offered one year contract extensions to qualifying purchasers. While harvest increased slightly, a soft market coupled with the offer of a one year extension on certain contracts and an increased amount of timber offered increased our volume under contract.

While increasing efficiency and reducing timber unit costs has been a top emphasis item for the Forest for the last few years, timber unit costs increased approximately 10% in FY 2007. This is due in part to receiving a large amount of money and substantially increased target late in the year. While the target was met, because of when the money was received, it could not be used as efficiently as if it were received at the beginning of the year.

Competition for the Chippewa National Forest timber volume was strong although there was a decrease in the number of bidders by approximately 10%. There were 19 bidders during FY 2007 compared to 21 in FY 2006. On average, there were 1.3 bidders per sale, which compared to 1.9 bidders last fiscal year. The number of bidders per sale ranged from zero to seven. There were five single bid sales. Three of the sales offered were not bid upon initially. One was reoffered and sold and the other two were purchased after 15 days. This decrease in total number of bidders may have been due to the sluggish market conditions and the amount of volume already under contract.

Table 4. Ratio of sawtimber to pulpwood volume sold

	Decade 1 (Proposed)	Actual Ratio FY 2007	Actual Ratio FY 2006	Actual Ratio FY 2005
Sawtimber:Pulpwood	32:68	21:79	18:82	15:85

As shown above, the ratio of sawtimber to pulpwood is quite a bit lower than what was predicted in the Plan. This is due to more thinning in smaller diameter conifer stands than was anticipated.

In FY 2007, prices bid for timber decreased dramatically with sawtimber prices of most species dropping by 25% and the prices paid for pulpwood dropping by 45% compared with FY 2006. This resulted in a 40% decrease in average bid prices for all species/products combined to \$65.07 per MBF.

A comparison of the actual revenues generated to the estimated revenues from timber harvest is displayed in the table below. The estimated revenues are taken from Forest Plan Revision, Volume II Appendices, Table BEIS-7, pg B-11.

Table 5. Actual verses Estimated Revenues from Timber Production in FY 2007

Species	Product	1996-1998 Avg. Price/MBF Expected Revenue	FY 2007 Avg. Price/MBF	Percent Difference
Aspen	Pulpwood	59.30	58.13	(2)
Mixed Hardwood	Pulpwood	28.13	44.73	37
Mixed Hardwood	Sawtimber	54.12	52.22	(4)
Balsam Fir	Pulpwood	61.96	59.85	(4)
Spruce	Pulpwood	64.38	50.50	(27)
Spruce	Sawtimber	75.41	102.69	27
Pine	Pulpwood	28.50	66.32	57
Jack Pine	Sawtimber	127.13	105.96	(20)
Red/White Pine	Sawtimber	238.63	115.57	(106)

Overall revenues in FY 2007 were significantly lower than those generated in FY 2006. They are also lower than those estimated in the FEIS analysis. The exceptions are mixed hardwood pulpwood, spruce sawtimber and pine pulpwood. Much of the decline in prices was due to slowing demand for OSB, which can utilize many of the species listed. Hardwood pulp can also be used for firewood and that market remains steady. Spruce sawtimber and to some degree the pine pulpwood can be sawn for lumber and that market has not declined locally as much as the OSB market.

The bid ratio (advertised value/bid value) for FY 2007 remained at 77%. This is an increase over FY 2006 and reflects tighter market conditions and less room for increases in bids due to lower profit margins.

Acres Harvested

The Chippewa National Forest harvested timber on a total of 2841 acres in FY 2007. Table 6 compares the acres harvested by treatment method to the acres Proposed for Decade 1 (Table

APP-D2: Forest Plan, D-3, Estimate of Acres of timber harvest by treatment method (Forest Wide)). Table APP-D2 was changed as part of an administrative correction on September 14, 2007. Changes include an increase in the acres and percentage of thinning treatments and a reduction in the acres and percentage of uneven-aged treatment in red pine, white pine, spruce-fir, northern hardwood, oak and black ash in Decade 1. Total acres treated is unchanged. It should be noted that the numbers reflect accomplished acres, that is acres harvested which may be from projects planned and sold prior to the 2004 Forest Plan Revision.

Table 6. Comparison of acres by treatment method to that Proposed for Decade 1

Treatment Method	Decade 1 (Proposed)		Total (FY 2005-2007)		Actual Accompl (FY 2007)		Actual Accompl (FY 2006)		Actual Accompl (FY 2005)	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Thinning	16,000	21	4982	53	1439	51	1371	53	2172	54
Clearcutting	29,866	39	2440	26	709	25	782	31	949	24
Shelterwood/ Partial Cut 30	11,149	14	1279	13	495	17	295	11	489	12
Uneven-aged (all types)	20,124	26	709	8	198	7	124	5	387	10
Totals	77,139	100	9370	100	2841	100	2572	100	3997	100

The Decade 1 harvest treatment numbers projected in the Forest Plan are decadal projections not annual projections and are based on full funding and implementation of the Plan. Mixes of potential harvest treatments is a tool to accomplish Forest Plan objectives but are not an objective in and of themselves. Each environmental analysis (EA) and the set of harvest treatments resulting from that decision are based on meeting the vegetation objectives for the Landscape Ecosystem (LE) in which the project is being implemented. Vegetation objectives and existing conditions vary by LE, so some peaks and valleys are expected in annual harvest treatment types, but over the decade meeting the vegetation objectives across a mix of project areas should yield harvest treatments similar to those projected in the Plan. Comparing the percentages on an annual basis will be useful as harvest treatments are tracked over time.

Even with the administrative correction which is reflected in the Decade 1 figures in Table 6, thinning acres continue to be over accomplished. There are several reasons for this. This is in part a reflection of a large thinning project that was implemented in the first two years of Forest Plan implementation. Many of the sales in this project were completed in 2007. In addition, our highest priority LEs for treatment tends to be the Dry Mesic Pine and Dry Mesic Pine-Oak LEs. These are the LEs that are most out of sync ecologically and have the highest fire hazards. Red pine is a significant component on these LEs and has been a focus for treatment. In addition, there is a large amount of red pine that has recently become the age and size that would benefit from commercial thinning.

Clearcutting is lower than Forest Plan projections. During Forest Plan revision it was recognized that there would be less regeneration in the initial years of Forest Plan implementation as the youngest vegetation age classes are over-represented in most LEs.

The actual percentage of shelterwood and partial harvest is comparable to that proposed in the Plan and are not a concern at this time.

Uneven-aged harvest prescriptions are less than projected thus far. More emphasis has been placed on uneven-aged treatments in hardwood and some conifer stands in recent planning projects.

It is recognized that some shifts will need to be made in planning and implementation to meet the decadal Forest Plan objectives at the current rate.

Acres of Harvest Planned

The above discussion focuses on the acres actually *accomplished* or harvested for each fiscal year since FY 2005. Acres harvested may be from projects planned and sold prior to completion of the 2004 Forest Plan Revision. The time lag between planning and harvesting exists because it typically takes 1-2 years to do the field work to prepare the sales. Length of timber sale contracts vary from 2-5 years so harvesting may occur at anytime within that timeframe. The following discussion highlights the acres *planned* for harvest by treatment type since the 2004 Forest Plan went into effect in August 2004.

Table 7. Summary of planned treatments, acres, and volume from August 2004 through FY 2007 compared to decade 1 targets.

Project Decisions under 2004 FP			Forest Plan	Decade 1 acres	Percent of decade acres
	Acres	Percent			
Thinning (acres)	9,272	31	*Thinning	16,000	58
Clearcut & Seedtree (acres)	8,422	34	*Clearcut	29,866	28
Shelterwood (acres)	2,520	9	*Shelterwood	11,149	22
Individual Tree & Group Selection, Partial cut, Improvement (Acres)	7,060	26	*Uneven-aged	20,124	35
		100			
Total Acres Planned for Harvest	27,274		**Total Acres Harvested 1st 10 years of implementation	77,139	35
Estimated Volume (MMBF)	157		***Timber Volume (MMBF) 1st 10 years of implementation	580	27

* Target acres from Forest Plan Administrative Correction 9; Table APP-D2.

** Total acres from Forest Plan Table APP-D2.

***Volume (Allowable Sale Quantity) from Forest Plan pg. D-1.

This information was compiled for treatments, acres and volume estimates contained in the decisions signed by the line officers since August 2004. Acres are approximations based on GIS data used during the planning process. During implementation some acres may be dropped due to inaccessibility, mitigations for wetlands or other resources. For the purposes of this exercise, individual tree and group selection, partial cuts and improvement cuts were put in uneven-aged category.

Looking at the treatments for project decisions made under the 2004 FP, roughly three years into the decade, note the following trends:

- Clearcutting and seed tree harvests account for approximately 34% of the treatments planned still below the 39% for decade 1.
- Thinning acres comprise 31% of the treatments which is higher than the 21% estimated at the end of decade 1.
- Shelterwood acres are about 9% of the planned treatments, slightly below the 14% at the end of decade 1.
- Uneven-aged treatment acres are roughly 26% which at this point is in line with the 26% projected for the end of the decade.

The percentages of decade 1 acres for each treatment, that is the acres of treatment planned during FY 2005-FY 2007 compared to the Forest Plan projected acres at the end of Decade 1, are displayed in the last column of the above table. For example, thus far 8422 acres have been planned for clearcutting compared to an estimated 29, 866 acres which is 28% of the decadal acres. Approximate percent of decade 1 acres for each treatment planned since August of 2004 is as follows:

- 58% of thinning acres
- 28% of clearcuts or seed tree acres
- 22% of shelterwood acres.
- 35% of uneven-aged harvests
- roughly 35% of the projected decadal acres for harvest have been planned
- about 27% of the projected decadal timber volume has been planned .

Payments to Counties:

The federal government makes payments to states to cover some of the cost of local government services on tax-exempt National Forest System lands. The states pass those payments on to the counties in which national forests are located. Payments in Lieu of Taxes (PILT) payments are calculated and made by the Department of Interior, Bureau of Land Management. These payments are appropriated annually by Congress based on available funding and formulas that take into account the population in the affected counties, the number of acres of federal land in those counties, and other payments received by the counties based on federal land payments.

Payments are also made to states amounting to 25 percent of gross receipts from activities on national forests, such as timber sales, mining, special uses and recreation. Congress passed the Secure Rural Schools and Community Self-Determination Act (SRS) in 2000, which allowed counties to choose a level payment based on the high-three year average of 25 percent payments, or to continue to receive 25 percent of the current year's receipts. On the Chippewa National Forest, Itasca County and Cass County opted for the level payment. Beltrami continued with the payment based on current annual receipts. The following tables show the breakdown of the FY 2005 through FY 2007 payments to Beltrami, Cass and Itasca counties.

The SRS expired in 2006, but Congress extended it through 2007. If it is not extended or reauthorized, the Forest Service will make the 25 percent payments to all counties based on

current year receipts. Unless Congress reauthorizes the SRS act, next year Cass and Itasca counties will be back on the 25% formula, the same as Beltrami. If timber and other receipts are similar in FY 2008 to what they were in FY 2007, then Beltrami will receive approximately \$58,735 in 25% fund payments (same as this year); Cass will receive \$263,661 in 25% payments; and Itasca will receive \$282,269 in 25% payments – roughly a 50% drop in payments.

Table 8. Payments to Counties.

FY 2007		25% FUND		Payment in Lieu of Taxes		Grand total	
County	Acres	Total \$	Per Acre	Total \$	Per Acre	Total \$	Per Acre
BELTRAMI	64,722	\$58,735	\$0.907	\$71,587	\$1.11	\$130,322	\$2.01
CASS	290,696	\$549,068	\$1.889	\$205,869	\$0.71	\$754,937	\$2.60
ITASCA	311,123	\$587,494	\$1.888	\$223,917	\$0.72	\$811,411	\$2.61
TOTAL	666,541	\$1,195,297	\$1.793	\$501,373	\$0.75	\$1,696,670	\$2.55

Table 9. Summary of payments to Counties from FY 2005 – FY 2007.

		FY 2007		FY 2006		FY 2005	
County		Total \$	Per Acre	Total \$	Per Acre	Total \$	Per Acre
BELTRAMI		\$130,322	\$2.01	\$123,881	\$1.91	\$116,424	\$1.80
CASS		\$754,937	\$2.60	\$754,284	\$2.59	\$742,281	\$2.55
ITASCA		\$811,411	\$2.61	\$811,197	\$2.61	\$798,286	\$2.57
TOTAL		\$1,696,670	\$2.55	\$1,689,362	\$2.53	\$1,656,991	\$2.49

3. All-Outputs

Monitoring Requirement:

How close are projected outputs and services to actual?

Monitoring Drivers:

A quantitative estimate of performance comparing outputs and services with those projected by the forest plan; (36 CFR 219.12(k)).

Background:

Information in this section is specific to the estimated amount of an activity or Practice listed on Table APP-D4 in the Forest Plan, Appendix D. Proposed and Probable Practices, Goods Produced, and Other Information.

Table APP-D4 lists forest management activities, other than timber harvest, that are proposed to work toward the desired conditions and objectives during the first 10 years of Plan implementation. Accomplishments are from the Performance Accountability Report (PAR)

database. The Social and Economic Stability section presents and discusses information tied to timber harvest.

Table 10. Proposed Practices and accomplished by FY and total.

Table APP-D4: Proposed Practices (Forest-wide)		Accomplished*			
Activity or Practice	Estimated Amount for decade 1	Total	FY 2007	FY 2006	FY 2005
Stream Channel Reconstruction	5 to 30 miles	11 miles	4 miles of stream restored or enhanced	2 miles of stream restored or enhanced 0.1 mile of reconstruction	5 miles of stream restored or enhanced
Sensitive Plant Habitat Restoration	20 projects	0	0	0	0
Wildlife Habitat Restoration	80 projects	2409 234 459 12	500 acres terrestrial 35 structural improvements 0 acres aquatic 4 projects	655 acres terrestrial 66 structural improvements 60 acres aquatic	1254 acres terrestrial 133 structural improvements 399 acres aquatic 8 projects (terrestrial)
New ATV trail designated (maximum amount listed)	90 miles	0	0	0	0
New Snowmobile trail designated (maximum amount listed)	100 miles	0	0	0	0
New Water Access Sites (maximum amount listed)	5 sites	0	0	0	0
Roads Constructed (only OML –1 roads being constructed)	19 miles	0	0	0	0
Roads decommissioned (system)	200 miles	58	1.1	14.8; 2.52 miles unauthorized	13.2; 28.9 in FY 2004

*Accomplishments include projects completed using Forest Service and partnership funds combined

Discussed below are areas of accomplishment pertinent to stream channel reconstruction, wildlife habitat restoration, and road decommissioning.

In FY 2007, the Chippewa's Wildlife, Fish, and Rare Plants staff accomplished 30 projects totaling over \$419,000. Of these 30 projects, 22 were accomplished with partners, who include natural resource professionals from Tribal and governmental agencies, lake and watershed associations, local schools and universities, and civic organizations. These 22 partnership projects were accomplished by 15 partners who contributed over \$84,600 in goods and services for wildlife, fish, and naturewatch (interpretative) projects. Together we accomplished:

- 500 acres of terrestrial habitat improvements and 35 structural (wildlife) improvements
- 46 acres of lake habitat improvements & 4 miles of stream habitat improvements
- 2 miles of habitat inventory in streams and 48 acres of habitat inventory in lakes
- 320 acres of Threatened, Endangered & Sensitive species habitat inventory (terrestrial & aquatic). Dragonfly and longear sunfish surveys were conducted.
- 11 monitoring plans
- 1 administrative study on Goblin Fern (see Research & Studies section), and
- 5 naturewatch presentations on wildlife, fish, and rare plants

Dragonfly, damselfly and longear sunfish surveys were conducted on the forest. The main focus of the surveys was to sample species either on the RFSS list or the Species of Greatest Conservation Need (SGCN) list for the MNDNR. The longear sunfish was recently found on the Chippewa NF.

In addition to the Goblin Fern administrative study underway on the forest, the effectiveness of transplanting Goblin fern along the pipeline has been monitored for the last five years. The status of both studies is discussed in the Research & Studies section of this report.

A partnership is in place to ensure that a population of several thousand Showy Lady's Slippers, the state flower of Minnesota, located along Hwy 39, are not irreparably damaged or eliminated during the highway upgrade. Plans are underway to transplant the flowers. A recent project on the Walker District also included plans to plant Canada yew in 2008.

Road decommissioning is defined as activities that result in the stabilization and restoration of unneeded roads to a more natural state. In order to meet the decadal objective of decommissioning 200 miles of road, the Forest would need to average approximately 20 miles of decommissioning per year. In FY 2007 1.1 miles of system road was decommissioned and 0 miles of unauthorized (non-system) road. A total of 58 miles of system roads have been decommissioned since the inception of the Forest Plan. The decommissioning was completed through a mixture of tree plantings, placing rock berms at the entrances, and also through natural revegetation.

Accomplishment data are stored in the Wildlife, Fish and Rare Plant Management System on line database at: [WFRP Management System Home - Watershed, Fish, Wildlife, Air & Rare Plants - USDA Forest Service](#).

Evaluation and Conclusions:

The Wildlife, Fisheries and Rare Plants program on the Chippewa National Forest is implementing projects at a level consistent with that proposed in the Forest Plan for aquatic and terrestrial habitats enhancement and restoration. The program effectively leverages partnership funds to achieve program objectives, conduct surveys and inventories and outreach the public through educational programs.

There have been 12 signed project decisions during FY 2004-2007 that have identified 154.2 miles of system roads and 14.75 miles of unauthorized roads for decommissioning.

Monitoring of recently decommissioned roads to ensure they remain effectively closed and are returning to a more natural state occurred and was reported in the FY 2005 Monitoring and Evaluation Report. Further monitoring was conducted in FY 2007; refer to the Wildlife TES section for information on the effectiveness of closures.

Recommendations:

The program should continue active partnership outreach and look for opportunities to restore sensitive plant habitats where necessary.

Funding in other resource areas such as that for Watershed Restoration, Wildlife Habitat and Threatened, Endangered and Sensitive species protection should be directed toward road decommissioning when removal or closure of system or unauthorized roads meets objectives for those resources.

Continue with surveys for RFSS or other species of concern. Findings from surveys on dragon flies and longear sunfish still need to be summarized and shared.

4. All-Costs

Monitoring Requirement:

How close are projected costs with actual costs?

Monitoring Drivers:

Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the forest plan (36 CFR 219.12(k) [3]).

Background:

The Forest Plan itself does not use cost estimates and does not propose objectives based on projected costs. It should be noted that during the analysis for alternatives for the Revised Forest Plan, budget constraints were used to estimate total Forest expenditures and applied to the alternatives. These expenditures, however, are not displayed in the FEIS. Details regarding expenditures are contained in the project record (FEIS, B-47). Regardless, a look at the annual budget and the changes from year to year in total and for each resource or fund area, may

provide some insight into when and where objectives become a challenge and are difficult to meet because of limited funds.

Evaluation and Conclusions:

Table 11. Budget allocations for the Chippewa National Forest for FY 2005 through FY 2007.

Fund	FY 2007	FY 2006	FY 2005
Inventory & Monitoring	\$ 434,000	\$ 494,000	\$ 864,000
Landownership Management	\$ 366,000	\$ 411,000	\$ 526,000
Minerals & Geology	\$ 96,000	\$ 105,000	\$ 150,000
Forest Planning	\$ -	\$ 50,000	\$ 183,000
Range	\$ 4,700	\$ 5,000	\$ 4,000
Recreation & Heritage	\$ 614,000	\$ 715,000	\$ 856,000
Timber	\$ 1,952,000	\$ 920,000	\$ 2,183,000
Vegetation, Watershed & Air	\$ 546,000	\$ 628,000	\$ 499,000
Wildlife & Fisheries	\$ 419,000	\$ 455,000	\$ 583,000
Rehabilitation & Restoration	\$ 13,000	\$ 19,640	
Facilities - Recreation	\$ 121,000	\$ 228,000	\$ 475,000
Facilities Maintenance	\$ 188,000	\$ 200,000	
Roads	\$ 758,300	\$ 697,000	\$ 950,000
Trails	\$ 156,600	\$ 168,000	\$ 209,000
Hazardous Fuels Reduction	\$ 741,000	\$ 826,000	\$ 1,192,000
Wildfire Preparedness	\$ 680,000	\$ 615,850	\$ 910,000
Land & Water Conservation Fund	\$ 70,000	\$ 61,000	\$ 69,000
Reforestation Trust Fund	\$ 321,000	\$ 314,000	\$ 565,000
Salvage Sales	\$ 650,000	\$ 800,000	\$ 900,000
10% Roads and Trails	\$ 165,000	\$ 187,000	\$ 133,000
Knutson-Vandenberg (KV) Funds - regular	\$ 777,000	\$ 800,000	\$ 878,000
KV - Regional Direction	\$ 899,000	\$ 778,000	
Recreation Fee Demo	\$ 375,000	\$ 447,000	\$ 319,000
Federal Highway Trust Fund	\$ 16,000	\$ 19,500	\$ 17,000
Federal Highway- Planning Funds	\$ 19,500		
Federal Highway – Aquatic Passage	\$ 15,000		
Federal Highway – Marcell Discovery Center	\$ 161,764		
National Scenic Byways	\$ 56,000		
Maps for Visitors & Others	\$ 1,000		
Brush Disposal	\$ 2,000	\$ 1,000	\$ -
Quarters Maintenance	\$ 10,000	\$ 15,000	\$ 20,000
Coop Work -- Agreements	\$ 34,200	\$ 75,000	\$ 100,000
Coop Work – Non-agreement	\$ 52,800		
Timber Pipeline -- Recreation Backlog	\$ -	\$ 151,000	\$ 200,000
Timber Pipeline – Botanical Products	\$ 2,000	\$ 3,000	
Timber Pipeline – Timber Sales	\$ 77,000	\$ 158,500	\$ 372,000
Cost Pools	\$ 1,759,400	\$ 2,432,842	
Grand Total	12,553,264	12,780,332	13,157,000

Those resources or fund areas that have undergone declining budgets since FY 2005 are in bold type. With the exception of Timber and Vegetation, Watershed & Air, many of the resource areas have had a steady decline in their annual budgets. Wildlife & Fisheries, Recreation & Heritage, hazardous fuels reduction, inventory and monitoring have experienced a 29-50% decrease in dollars since FY 2005 amounting to a difference of about \$1,300,00 just in those four areas. There has been fluctuation in some of the resource areas. For example, with timber there was an increase in FY 2007 compared to FY 2006, but the FY 2007 allocation was still less than than received in FY 2005. With the FY 2007 allocation came an expectation and commitment to increase the volume sold.

Overall, the total budget has declined by approximately \$603,500 since FY 2005. Although Regional direction has been to fully implement the Forest Plan, it becomes a challenge in that we are required to do more with less.

5. Off-Road Vehicles (ORVs)

Monitoring Question:

To what extent is the Forest providing ORV opportunities, what are the effects of ORVs on the physical and social environment; and how effective are forest management practices in managing ORV use?

Monitoring Driver:

The Forest Service ORV management is predicated on a number of policies, rules, regulations; including those detailed below.

36 CFR 219.21[g]. Off-road vehicle use shall be planned and implemented to protect land and other resources, promote public safety, and minimize conflicts with other uses of the NF system lands. Forest planning shall evaluate the potential effects of vehicle use off roads and on the basis of the requirements of 36 CFR 295 part of this chapter, classify areas and trails of NF system lands as to whether or not off-road vehicle use may be permitted.

D-RMV-1 The forest provides RMV road and trail riding opportunities with experiences in a variety of forest environments, while protecting natural resources.

D-RMV-2 Allowed, restricted, and prohibited RMV uses are clearly defined to the public. Where practical, RMV policies are consistent with adjacent public land management agencies.

O-RMV-1 The Forest will determine which existing OML 1 and OML 2 roads are appropriate or inappropriate for RMV use.

O-RMV-2 A maximum of 90 additional ATV trail miles and 100 snowmobile trail miles with associated trail facilities (trailhead parking, signs, toilets, etc.) may be added to the designated NF trail system.

Background :

This monitoring information will be used to implement the Forest Plan and the National Travel Management Rule (2006). Travel Management Rule expectations are described below. There continues to be no cross country use of motorized vehicles on the Chippewa NF.

Travel Management Rule

The Travel Management Final Rule (2006) provides expectations for ORV travel access management on the National Forests. The intent of the Rule is to provide regulation of ORVs as a result of the tremendous increases in the number and power of ORVs, widespread environmental and social impacts from unmanaged recreation while recognizing that motorized recreation is a legitimate use of National Forest system lands in the right places. Following is a summary of those requirements:

- The Rule requires each national forest and grassland to designate those roads, trails, and areas that are open to motor vehicle use by class of vehicle and if appropriate, time of year. Field units may provide for limited cross-country travel for big game retrieval or dispersed camping if appropriate, to respond to local situations. This authority will be used sparingly.
- Objective Maintenance Level (OML) 1 roads are closed to highway –legal vehicles, but are still needed for long-term access. They will not be displayed on the motor vehicle use map and thus are not open to ORV travel. In special cases, an OML1 road may be designated as a trail and displayed as a trail on a motor vehicle use map.
- OML 2 roads are maintained for high clearance vehicles and would generally be open to ORV use.
- OML 3, 4, and 5 roads are open and maintained for travel by passenger cars and will generally not be open for ORV use. However, there may be some roads available upon recommendation of a mixed-use analysis.

Law Enforcement

There are two law enforcement officers and 21 forest protection officers on the CNF. Enforcement of forest orders and other appropriate 36 CFR regulations occurs as needed on the Forest. For many years, including 2006, there has also been a Cooperative Law Enforcement agreement with Cass and Itasca Counties that provides for a county deputy to work a certain number of days per year that are concentrated on National Forest land.

ATV Trail

The Soo Line Motorized Trail is currently the only designated ATV trail. It is approximately 20 miles and is a designated snowmobile trail in the winter.

Information gathered during this year's monitoring process has not been gathered in prior years under the 1986 Forest Plan. Initial information establishes the baseline for the next decade.

Monitoring Activities:

Designated ORV Trails

The Soo Line continues to be the only designated motorized (non-snowmobile) trail. Field observations of the Soo Line do not indicate any resource damage as a result of ATV use.

Collaborative Team and Travel Rule Implementation Process in FY 2006/2007

The CNF is actively working at implementing the Forest Plan and Travel Management Rule. To effectively and cohesively meet the needs of forest visitors, we are collaborating with the MN DNR; Cass, Itasca and Beltrami Counties; LLBO; and associated Townships in an interdisciplinary team of recreation, law enforcement, wildlife, and vegetation managers; FS, DNR and County leadership, elected government officials; and lay people as sponsored by counties.

From the collaborative group, there has been a Planning OHV (Off Highway Vehicle) Team convened to strategically plan the OHV analysis process, and subsequently there have been Working Groups convened to address issues needing recommendations. Working group task examples include recommending roads as open or closed to OHV access, OHV trail opportunities;, OHV informational and regulatory signing, and mixed use analysis on roads.

Law Enforcement

Law enforcement personal, including Forest Service, State, Counties, Local and Tribal officers, monitor and respond to activities and behavior on the National Forest and adjoining lands.

Offenses are combined for reporting purposes into categories and reported in the Eastern Region-Northwest Zone Law Enforcement Annual Report. ORV offenses may be included in 1) occupancy and use offenses and 2) travel management restrictions on and off road offense categories. Following is a table indicating criminal ORV offenses by year as recorded in the Law Enforcement Annual Report (LEIMARS records).

Table 12. ORV offenses by year.

Incidents	2002	2003	2004	2005	2006	2007
ORV	21	142	52	71	62	105

The trend from FY 2002 to FY 2007 has reflected an increase in the number of reported ORV incidents. Fluctuations in incidents can be accounted for a change in directed priorities of the law enforcement officers and a change in the numbers of forest protection officers. Qualitative information from Forest Service employees reflects no decrease in the illegal use of ORVs on the Forest over the past years.

Criminal offenses relating directly to the illegal use of ORVs including CFR 261.56 (possesses or uses vehicles off road); 261.54A (using vehicle on road closed by order) are number three and five in the top ten offenses on the Chippewa in FY 2005.

Road Closure Monitoring

Road closures were monitored in FY 2007 to determine effectiveness of road closures and methods of closure (gates, barriers, etc). The information contained in this report is important to ORV use on the CNF because approximately 854 miles of roads of low standard roads are closed to ORVs and many of these roads have some form of visual closure devices. The results indicate that road closures and road gates were effective 62% of the time in stopping motorized traffic from proceeding further along a road. More detailed information on the results of road closure monitoring is in the Wildlife: Threatened and Endangered Species – Roads & Trails section of this report.

Mixed Use OML 3, 4, 5

NF System roads are designed primarily for use by highway-legal vehicles such as a passenger car or log truck. Some NF System roads also provide recreational access to non-highway legal ORVs. Motorized mixed-use is defined as designation of a NF System road for use by both highway-legal and non-highway-legal motor vehicles. OML 3, 4 and 5 roads are higher standard roads and subject to the National Highway Traffic Safety Act and more strict standards for public safety. To allow ORV use on an OML 3, 4, or 5 roads, a mixed-use determination has been completed. Items under consideration for this analysis include driving conditions, operator characteristics, road design and condition, and safety.



Figure 1. Illegal Cross-Country ATV Use

Off-Highway Vehicle Road Travel Access Project

The Off-Highway Vehicle Road Travel Access Environmental Assessment was completed in 2007. The purpose of this project was to identify the roads open for OHV use on the CNF in concert with the goals and objectives outlined in the 2004 Forest Plan. The project also complies with the 2005 Travel Management Rule requiring a designated route system for motor vehicle use by vehicle class and if appropriate, by time of year.



Figure 2. Legal ATV Road Use

Evaluation and Conclusions:

The outcome of monitoring is potential change in management within the context of the Forest Plan. The work done to implement the Forest Plan and Travel Management Rule is ongoing, iterative and specifically involves many components such as roads, signs, trails

and available motor vehicle use maps, and law enforcement. Evaluation and conclusions for FY 2007 focused on the decision made by the Forest Supervisor (November 2007) regarding the Off-Highway Vehicle Road Travel Access environmental analysis. This is described below.

Collaboration with the Minnesota DNR, Itasca, Cass and Beltrami Counties and the Leech Lake Band of Ojibwe Department of Resource Management continues to be crucial for the visitor to the area and to the successful management of natural resources, social and economic conditions and infrastructure such as National Forest roads.

Off-Highway Vehicle Road Travel Access Environmental Assessment (EA)

(Note: The EA used the phrase Off-Highway Vehicle (OHV) which is used in the following discussion for consistency. OHV and ORV can be used interchangeably.)

The Off-Highway Vehicle Road Travel Access decision designates only existing, selected Forest Service system roads for OHV use. With this decision, there will be 1,486 miles (59%) of Forest Service system roads open for OHV use. There are 1,038 miles of system roads closed to ORV use. As a result of previous site specific analysis and decisions there are 110 miles of roads that remain closed seasonally to OHV use to protect threatened, endangered, and sensitive species, or other resource considerations. Prior to this decision there were 1,530 miles (61%) of Forest Service system roads open for OHV use.

This decision can be characterized in general in that it closes a number of OML 2 roads and opens a number of OML 3 and 4 roads. Most OML 2 roads were closed due to resource and management concerns. OML 3 and 4 roads were open to OHV use based on the Mixed Use Analysis which considered the safety concerns related to allowing OHV use on higher standard roads and to provide greater connectivity of ORV travel routes.

The CNF road system provides loops that connects local communities and locations for longer OHV riding opportunities. There is also access to specific areas of the Forest on roads that bring the rider in and out on the same road. Forest Service system roads that are not gated or otherwise closed, continue to be open to highway-licensed vehicles during hunting seasons. There are no roads specifically opened for OHV access only during hunting season.

Table 13. Miles of CNF Roads Open and Closed to OHV Use*

OML Road	Open for OHVs	Closed to OHVs
OML 1	0	377
OML 2	1214*	477
OML 3	107	76
OML 4	165	81
OML 5	0	27
Total	1486	1038

* 110 miles of roads are closed seasonally for threatened, endangered or sensitive species habitat protection.

Mitigation Measures Specific to the OHV Road Travel Access Decision

The following mitigation measures will be used to address specific concerns identified in the environmental analysis. Some of these measures have been standard practices on the forest in the past.

- 1) Roads that travel through sensitive soil types on the CNF will be closed to motorized vehicles over 1,000 pounds to protect natural resources and the road infrastructure.
- 2) Roads that travel through threatened, endangered, or sensitive species habitat areas requiring limited access will be closed during times specified within the Forest Plan to that species.
- 3) All roads open to OHVs will be closed to OHV use from March 15 to May 1 to improve enforceability and provide protection of the road bed.
- 4) Road number identification signs will correlate with identification numbers on the Motorized Vehicle Use map. Installation of all new road identification signs is scheduled for completion by the end of 2007.

As a part of the Decision, commitments are also made to:

- *Motor Vehicle Use Map (MVUM):* The CNF had available to the public a map in March 2008 that will indicate roads that can best accommodate OHV use. The roads designated on this map will be the only Forest Service roads where OHV use will be allowed. The map will be updated annually incorporating information from the public and changes in resource conditions.
- *Public Awareness:* Successful implementation of this project includes public awareness of the OHV access opportunities on the CNF. Public awareness will be enhanced in a number of ways. The Forest Service will continue to work closely with other agencies (DNR, LLBO, County and Township governments) to let people know where they can ride their OHVs within the CNF boundary. Field contacts by Forest Service employees, including our law enforcement officers, will increase public awareness of OHV designations through field contacts with users.
- *Road closures:* The effectiveness of road closures in the Chippewa and Superior National Forests, as described in the CNF FY 2007 Road Closure Report and also the Superior NF Monitoring Report 2006 has been reviewed. A number of closure techniques were evaluated for road closure effectiveness. Gates, rock berms and/or boulders, and natural vegetative closures have been identified as the most successful in preventing illegal OHV use. Also reviewed were the “Sustaining Minnesota Forest Resources; Voluntary Site- Level Forest Management Guidelines for Landowners, Loggers and Resource Managers: Maintaining and Closing Forest Roads, June 2005”, for effective road closure techniques.

The CNF will utilize the most effective road closure methods as indicated through these studies as well as ongoing monitoring analysis. Some road closures will be done in the near

future while others will be implemented as part of future projects. These have been identified and included in previous or in upcoming decisions.

- *Law Enforcement Collaboration:* Forest Service law enforcement officials will continue to work with state, county and Tribal law enforcement personnel to provide for effective enforcement of regulations and laws and also public education and information.
- *Monitoring:* Legal and illegal OHV use will continue to be monitored as part of our ongoing Forest Plan monitoring program. Information obtained through this monitoring will be used in subsequent decisions regarding OHV use of Forest System roads.

Trails: Each District of the Forest while working with DNR Trails and Waterways and County employees have identified potential areas for ATV trail development. These areas reflect the existing road riding opportunities, connections to opportunities, linkage to the existing cross-forest corridor trail, and proximity to rural communities. Trails will be more thoroughly explored at a later date (after the road access is defined and mapped) to further implement the Travel Rule and Forest Plan. Trail opportunities will be subject to the NEPA process.

Law Enforcement: Enforcement of regulations and forest orders will continue to occur over the next year.

6. Wildlife: Threatened and Endangered Species – Roads & Trails

Monitoring Question:

To what extent are road and trails closures effective in prohibiting unauthorized motor vehicle use?

Monitoring Drivers:

G-WL-7 When constructing new snow-compacting trails, access would generally be restricted on those trails, OML 1, OML 2, temporary, and unclassified roads that intersect the new trails unless these trails or roads are needed for other management purposes.

G-ORV-4 Roads that are determined through site-specific analysis to have immitigable resource and social concerns and/or do not meet management objectives will be effectively closed.

O-TS-3 New roads built to access land for resource management will be primarily OML 1 or temporary and not intended for public motorized use. Temporary roads will be decommissioned after their use is completed. All newly constructed OML 1 roads will be effectively closed to motorized road and recreation vehicles following their use unless they are needed for other management objectives.

O-TS-7 Unneeded roads will be decommissioned and closed to motorized vehicles. Roads that are not necessary for long-term resource management are considered "unneeded".

S-TS-3 As soon as access use is completed, stabilize temporary roads and effectively close them to motorized traffic. Vegetation will be established within 10 years after the termination of the contract, lease, or permit.

G-TS-12 On existing OML 1 roads, an effective barrier will generally be installed as needed to prevent use by highway-licensed vehicles and ORVs. ATV and OHM use may continue to be allowed on some existing OML 1 roads.

G-TS-16 Roads and trails designated for decommissioning will generally be subject to the following:

- a. The road or trail will be rendered unusable by motorized vehicles but may remain accessible to foot travel.
- b. Stream crossing structures will be removed.
- c. Road and trail fills will be removed from flood prone and wetland areas to restore stream and wetland crossings to original contours.
- d. Removed fill will be reused or disposed of in a way that will not restrict flow or contaminate surface water.
- e. Exposed soil will be revegetated.

Background:

Road Closure data is collected and evaluated every 1 to 4 years. Monitoring was conducted in FY 2005 and in FY 2007. The effectiveness of individual road closures is also monitored annually at the project level. This is a lower intensity/higher extensity implementation monitoring in that many sites are evaluated, but the time spent and the data collected at each site is fairly minimal.

Roads may be closed or decommissioned for a variety of reasons. Temporary roads are roads authorized by contract, permit, lease, other written authorization, or emergency operation for a specific resource management project and are not intended to be a part of the forest transportation system. They are not necessary for long-term resource management and should be decommissioned after use. All Forest Service System roads are assigned an Operation Maintenance Level (OML) with OML 1 being the lowest level of construction and maintenance and OML 5 being the highest. OML 1 roads are intermittent service roads and are closed to street legal motorized vehicular traffic. They may be periodically opened when needed for resource management activities and will generally be managed at OML 2 during the time they are open for traffic. Higher level system roads may be closed or closed seasonally based on resource concerns such as possible wetland damage or impacts to threatened or endangered species. Unauthorized roads are user developed or maintained roads that are not meant to be part of the Forest road system and vehicle travel is not allowed. Project level decisions often include closures of system roads that are no longer needed for resource management or access. These roads are decommissioned and taken off the road system. No further vehicle use is allowed on these roads, but they may remain open for foot traffic.

Monitoring Activities:

Road closure monitoring looks at the effectiveness of all closures on temporary roads, OML 1 roads, higher level system roads that are closed for specific resource reasons, unauthorized roads and decommissioned roads. This method of monitoring is meant to be extensive covering large areas and high numbers of sites, but it is of low intensity; spending a short amount of time at each site. The data was collected by forest staff. Observers drove all the roads in each of the areas and recorded locations and data at all visible closures. Data included GPS location, photo, type of closure, type of road surface, roadway characteristics and apparent effectiveness of the closure. A road closure is defined as ineffective if, at the time of visit, there is any evidence of vehicle use beyond a permanent closure or if there is evidence of travel *around* closed gates on roads that may be open seasonally or for administrative use. Some roads may be gated, but may allow use by lighter weight vehicles such as ATVs. Use around these gates does not constitute an ineffective closure unless it was easily apparent that the use was by much larger vehicles (“mudders” or 4 wheel drive trucks). Use on non-system roads with no closures was noted but not included in the data set as the goal of this monitoring is to determine effectiveness by type of closure. Data is stored in the GIS Trails layer and in the INFRA data base (gates).

The data from FY 2005 and FY 2007 are analyzed collectively, but differences and similarities between years are noted. The data was analyzed for the Forest as a whole and also by region or area of the Forest to determine if there were regional differences in either the effectiveness rate or of the closure practices used. Figure 3 shows the sites and the regions of the road closures monitored.

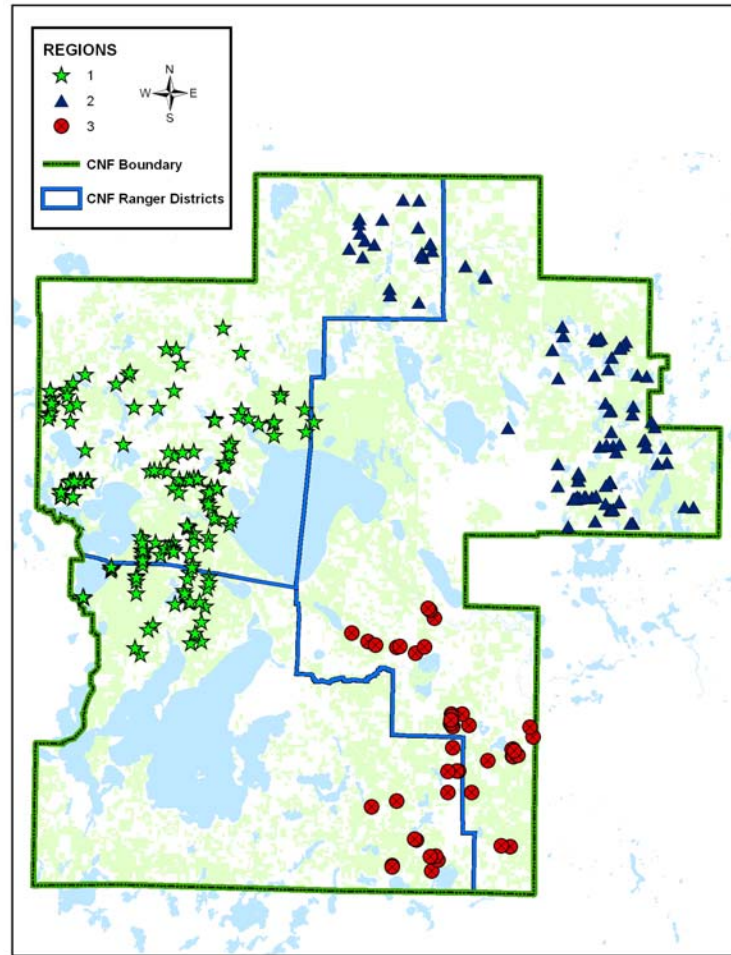


Figure 3. Road Closure Monitoring Sites by Forest region (FY 05 and FY 07).

Evaluation and Conclusions:

Table 14. Road Closure Summary for all sites monitored in FY 2005 and FY 2007

Type of Closures	Number Evaluated	Number Effective	Percent Effective (by Type)
Natural	2	2	100
Barricade	4	4	100
Rock Berm	21	16	76
Gate	157	106	68
Vegetation	43	29	67
Earthen Berm	114	56	49
Manufactured	2	1	50
Snow Berm	N/A	N/A	N/A
Not Sure	3	1	33
Total	346	215	62

189 closures and 157 gates were observed, 62% of them were effective. The result is slightly higher than the result of monitoring in FY 2005 (60%).

Table 15. Comparison of closures at 10 or more sites.

Type of Closures	Number Evaluated	Number Effective	Percent Effective FY 2007	Percent Effective FY 2005
Rock Berm	21	16	76	69
Gate	157	106	68	61
Vegetation	43	29	67	70
Earthen Berm	114	56	49	51

Of the closure types that were evaluated at 10 or more sites:

- rock berms were 76% effective,
- gates were 68% effective, higher than 2005 (61%)
- vegetation (slash mats, logging debris or logs) had a similar effectiveness as gates at 67%,
- earthen berms are the most commonly recorded permanent closures and are the least effective at 49%.

Although barricades and natural closures were 100% effective, there were only 4 and 2 of these respectively.

In summary, 62% of the road closures evaluated are effective. Thirty-eight percent are ineffective. Forest Plan standards and guidelines and project level decisions regarding road closure, decommissioning or obliteration do not allow for a margin of ineffectiveness. Roads that are closed should not have evidence of vehicle use.

This type of monitoring may under-estimate effective closures because if the road has been successfully closed for some period of time, it may not be visible to the field observers and is therefore not included in the data base. Still current road closure practices do not appear to be meeting Forest Plan objectives, guidelines or standards. It is likely that no single type of closure is best suited for all sites.

Recommendations:

The results of the FY 2005 and FY 2007 monitoring do not lead to dramatically different conclusions with the exception that the effectiveness of gate closures may be higher than previously thought. The overall rate of effectiveness is similar between the two years. Earthen berms have been shown to be the least effective closure in both years. While the Forest may benefit from a complete inventory of closed roads, road closure monitoring could reasonably shift focus at this time. The road closure effectiveness monitoring already conducted has met the intended goal of determining overall effectiveness and the different effectiveness of the most commonly used practices on the Forest.

Future monitoring should focus on other aspects of closure monitoring such as:

- Cost effectiveness of utilizing a higher cost method of closure (for example rocks) verses the cost of re-closing roads or the cost of enforcement when using lower cost/less effective methods (for example earthen berms).

- Implementation and monitoring of closure practices that may be effectively used in other places but are not commonly used on the Chippewa (for example trenching or ripping of the road surface followed by seeding or planting).
- Determine the timeframe between the closure of the road and the onset of unauthorized use. If most unauthorized use becomes established in the first year after road closure, increased monitoring, enforcement and closure rehabilitation during that timeframe may dramatically increase closure effectiveness. If the onset of unauthorized use is not a factor of time since closure then other solutions will need to be defined.

The use of earthen berms for road closures should be largely discontinued.

A complete inventory of non-system roads with no closure device should be completed. Each of these roads should either be effectively closed or added to the Forest road system and prescribed an operation maintenance level.

Building awareness of the difficulties in closing roads in a flat landscape should also continue. A Motorized Vehicle Use Map (MVUM) will be published in 2008. This map will clearly show the public where motorized use is allowed and where it is prohibited. This map will be used both as an educational and enforcement tool. A combination of enforcement, education and revised closures practices are all key to increasing the effectiveness of road closures.

7. Wildlife: Management Indicator Species

Monitoring Question:

What are the population trends of management indicator species?

Monitoring Driver—Desired Condition and Objectives:

36 CFR 219.19(a)(6). Population trends of the management indicator species will be monitored and relationships to habitat changes determined. This monitoring will be done in cooperation with state fish and wildlife agencies, to the extent practicable.

D-WL-3 Aquatic and terrestrial wildlife habitats and species populations, while constantly changing due to both management activities and naturally occurring events, are present in amounts, quality, distributions, and patterns so that NFS land:

- e. Provide for the desired quality and quantity of habitat for management indicator species and indicator habitats.

O-WL-1 Populations: Provide ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for management indicator species and management indicator habitats.

O-WL-15 Promote the conservation and recovery of the bald eagle. Population goal minimum: 150 occupied breeding territories.

O-WL-16 Promote the conservation and recovery of the gray wolf. Population goal minimum: contribution to state-wide goal of 1250-1400.

O-WL-32 Provide habitat to provide for population goal minimum: 20-30 breeding pairs (Northern goshawk).

O-WL-33 Increase amount of white pine to amounts more representative of native plant communities by planting or naturally regenerating white pine trees in white pine forest types and in other upland deciduous, mixed, and conifer forest types. This objective matches white pine objectives shown in the Landscape Ecosystems Objectives section.

Background:

This resource area monitors and evaluates population trends of designated Management Indicator Species (MIS). Management Indicator Habitats (MIH) were also identified for the Chippewa National Forest and along with MIS will be used to analyze the potential effects of management practices on wildlife habitats and populations. The monitoring and evaluation of MIHs began in 2006.

MIS are defined as species monitored over time to assess the effects of management activities on their populations and the populations of other species with similar habitat requirements (Forest Service Manual 2620.5). The rationale underlying the MIS concept is that by managing for and conserving the habitats in which MIS occur, other species that depend on these habitats would also be provided for. The Chippewa National Forest (CNF) has identified four MIS: gray wolf, bald eagle, northern goshawk and white pine. All four of these are species of high public interest, address major management issues, and can be practically monitored. Finally, the CNF and the other National Forests in the western Great Lakes region play a major role in contributing to the overall conservation of these species.

Gray wolf was selected as a management indicator species because:

- it was listed as a federally threatened species at the time of FP revision;
- the potential for impacts from National Forest management to affect its habitat, and existing opportunities to enhance wolf recovery efforts (FSM 2621.1); and
- the potential for management activities and human access/development to affect changes in wolf populations, prey habitat, and related prey species (deer, moose, and beaver).

Bald eagle was selected as a management indicator species because:

- it was listed as a federally threatened species at the time of FP revision;
- the potential for impacts from National Forest management to affect its habitat, and opportunities to enhance recovery efforts (FSM 2621.1);
- changes in eagle populations and habitat can indicate effects of management on other species requiring mature riparian forest; and
- it addresses major management issues related to riparian forests, large old trees and watershed health.

Northern goshawk was selected as a management indicator species because:

- population changes may indicate effects of management;
- it is a Region 9 Regional Forester's sensitive species;
- its habitat associations are well-documented in literature;
- it can function as an umbrella species – (its large area requirements and use of multiple habitats encompass habitat requirements of many other species); and
- its breeding productivity and population and habitat trends can be monitored at site and landscape level.

White pine is a high profile tree species in the forests of northern Minnesota and was selected as a management indicator species because:

- population changes are believed to indicate effects of forest management;
- it is a species with many social, economic and ecological values.
- it addresses major management issues about how much and where to promote white pine for its important wildlife habitat features, timber value, scenic quality and role in maintaining ecologically healthy forest composition and structure; and
- it is considered to be a keystone species, in that its overall effects on critical ecological processes and biodiversity are greater than would be predicted by its abundance.

The gray wolf and bald eagle were designated as MIS under the 1986 Land Management Plan for the CNF. As MIS, they have been monitored for the past 20 years. The northern goshawk and white pine are new MIS.

Monitoring Activities:

Gray wolf:

The Minnesota Department of Natural Resources (MN DNR) has monitored its statewide wolf population since the late 1970s. These surveys are expected to obtain data on wolf distribution and abundance in Minnesota. In the last 30 years, the survey methods have remained relatively consistent, using several combined sources of data. Previous surveys have taken place at 10-year intervals (1978-79, 1988-89, and 1997-98). However, in anticipation of a federal de-listing proposal in 2004, the survey interval was lowered to 5 years, and following federal de-listing in 2007, MN DNR decided to move forward with another comprehensive wolf population and distribution survey conducted during the winter of 2007-08. As with past comprehensive wolf surveys, the CNF is contributing observation information to this survey.

The MN DNR mails out instructions, data forms, and maps to cooperating natural resource agencies and consultants including: MN DNR, USDA Forest Service, US Fish and Wildlife Service, USDA Wildlife Services, US Geological Survey, Tribal and Treaty Resource Authorities, County Land Departments, Camp Ripley, Voyageurs National Park and forest products industries and consultants. Cooperating participants are asked to record a location and group size estimate for all wolf sign (visual, track, scat) observed during the course of their normal work duties from October 2007 through April 2008. The MN DNR then uses this information, along with other wolf and deer data, to compute the total wolf range and the total occupied range, as well as estimate the wolf population within the state of Minnesota (MN DNR,

2005). The MN DNR maintains and stores the data collected.

Bald eagle:

The Chippewa National Forest has been monitoring bald eagle populations within its proclamation boundary for over 30 years. Nesting activities are monitored by air. All known eagle nests within the CNF proclamation boundary are mapped and visited by fixed-wing airplane twice during the nesting season. An April activity flight is made to ascertain whether known nest areas are 1) occupied (eagles within the vicinity of a nest), 2) active (eagles on the nest or eggs visible), or 3) inactive (no eagles in the vicinity of the nest). All new nests detected along the flight path are recorded similarly and added to the list of known nest sites. A second productivity flight is made in July to record the number of eagle chicks in or around all previously identified active nest sites.

Nest locations are on an ARCINFO GIS coverage, and activity and productivity data collected from the eagle flights are stored in the FAUNA module of the Forest Service's Natural Resource Information System (NRIS).

Northern goshawk:

Individual known goshawk nest sites occurring on the CNF have been monitored for approximately 10 years in order to determine if the nest structure still exists, the nest site is active, and the pair was successful at fledging young. This monitoring has been and continues to be an important aspect in assessing northern goshawk populations and habitat conditions on the CNF, in Minnesota and in the western Great Lakes region. The methodology of monitoring nesting activity and productivity at known nest sites consists of conducting specific survey activities at certain times of the season based on goshawk nesting chronology. The detection of nesting goshawks is fairly reliable because this species is highly responsive to conspecific alarm calls during the pre-incubation or courtship stage, when the nesting pair is establishing a nest. The methodology for detecting nesting goshawks has been described in the literature (Kennedy and Stahlecker 1993, Roberson 2001). More recently, Andersen et al. (2003) described the protocol they developed for monitoring goshawk breeding activity. Three types of surveys are conducted during the monitoring season: occupancy surveys, nesting surveys, and nesting success surveys.

- Occupancy surveys are conducted to detect whether goshawks are present within the territory. These surveys occur from early March through mid-April. They may include a combination of nest observation and broadcasting goshawk alarm calls at various distances within a 500m radius of all known nest sites within a particular breeding territory. Some follow-up occupancy surveys may occur in June.
- Nesting surveys are conducted for those breeding territories in which goshawk activity was detected during the occupancy surveys. The nesting surveys are conducted in late April or May during the incubation period. They consist of quietly entering an area where there is some reason to suspect activity, but where nesting activity had not been confirmed. The primary objective of this survey is to confirm nesting so that a territory can be classified as "Active".

- Nesting success surveys consist of quietly entering the nest area and searching for chicks within all previously identified active nest sites. These surveys occur in June and July during the fledging period, in order to determine the final reproductive outcome at that nest. The area within 100 meters of the active nest is searched for chicks to determine whether the breeding outcome was a success or failure.

These surveys have been conducted by CNF and MN DNR personnel as well as goshawk researchers from the University of Minnesota. Recently, the known goshawk territories on the CNF have been monitored as part of the Northern Goshawk Monitoring Project undertaken by the MN DNR non-game program. This project has been on-going since 2003 and its primary objective is to assess occupancy and productivity of known goshawk territories in northern Minnesota. This productivity data is stored, maintained, and shared with other agencies by MN DNR.

Nest locations are on an ARCINFO GIS coverage, and activity and productivity data are stored in the FAUNA module of the Forest Service's Natural Resource Information System (NRIS).

Evaluation and Conclusions:

Gray wolf:

Wolf populations in the western Great Lakes have exceeded federal recovery goals for numerous years. This information led to recent action to remove the species from the federal list of threatened and endangered species, and in February 2007, the western Great Lakes gray wolf population, which includes Minnesota, was officially de-listed. Minnesota's wolves are now managed by MN DNR under the state wolf plan.

In recent years, there has been a gradual, long-term increase in the number of wolves in Minnesota. Although the Chippewa National Forest was not considered to be critical habitat for the wolf, it plays an important role in maintaining and sustaining wolf populations above the recovery goals due to a considerable amount of suitable habitat for the species and its prey. Survey results for Minnesota's 2007-2008 wolf survey will not be available until mid-2008, so the results presented here are summarized from the 2003-2004 survey and were previously reported in the FY 2005 Monitoring and Evaluation Report for the Chippewa. For the first time since consistent surveys were initiated in the late 1970s, total wolf range in Minnesota did not increase, and estimated occupied range declined only slightly. The 2004 population size estimate (3,020 wolves) is larger than in 1997-98; however, confidence intervals for the last two population estimates are largely widely overlapping. The MN DNR concludes that there has been no significant change in the distribution or abundance of wolves in Minnesota since 1997. In 1997-98, the survey estimated 2,445 wolves ranging over roughly 34,000 square miles of the state. This current wolf population estimate far exceeds the recovery plan goal of 1250-1400 wolves in Minnesota, as well as the MN DNR wolf plan's minimum population goal of 1,600 wolves to ensure the long-term survival of the wolf in Minnesota. Details of wolf survey methods, results and discussions can be found in the MN DNR report entitled "Distribution and Abundance of Wolves In Minnesota, 2003-04" authored by Erb and Benson.

The wolf population will continue to be monitored through population surveys every five years. The Endangered Species Act requires the U.S. Fish and Wildlife Service to monitor wolves in Minnesota for five years after de-listing to ensure that recovery continues.

Bald eagle:

Activity and productivity flights were conducted for bald eagle surveys in 2007. A total of 259 nests were surveyed. Of these, 113 nests were active, meaning that eggs were visible or an adult was observed incubating on the nest. Of these 113 active nests, 55 of them were successful in raising at least one chick to the fledgling stage. A total of 66 eagle chicks were observed during the productivity flights; 0.58 young fledged per active nest (44 nests with 1 chick, 11 nests with 2 chicks). This productivity is up slightly from 2005, the last year bald eagles were monitored on the Chippewa, when the average was 0.41 young fledged per active nest.

For the period from 1987 thru 2004 (18 years), Chippewa bald eagle monitoring shows an average of: 151 (range, 88-189) active breeding pairs; 96 successful breeding pairs (range, 66-108); and 1.02 young fledged per active nest (range, 0.76-1.39).

The total number of active eagle nests, the number of successful nests, and the number of fledged young per active nest are all below those recorded in the past. It is difficult to determine whether or not to attribute this to observer differences, timing of the flight, weather conditions during the nesting period or just a biological aberration for that year. While the increasing competition among breeding pairs at higher nesting densities is thought to be the primary factor in breeding success declines, there may be a need for further analysis of this aspect of eagle population dynamics. This may result in a somewhat different monitoring strategy geared toward more focused population sampling in portions of the Forest with varying eagle nesting densities.

Bald eagle activity and productivity flights are planned to occur again in 2009.

Northern goshawk:

Over the past 10 years, the number of known goshawk breeding territories has risen steadily on the CNF, from 9 known in 1996 to 42 known in 2007. This is generally believed to be a product of increased activity in goshawk habitat and a higher interest in monitoring goshawk populations, nesting activities and habitat conditions in northern Minnesota. The number of known active breeding territories and the number of successful breeding pairs has more than doubled, from 7 active breeding territories in 1996 to 16 in 2007 and 3 successful breeding pairs to 6 over the same time period. However, these latter two aspects of breeding territory information do not show the same corresponding increase to that exhibited by the number of known breeding territories on the CNF. The table below provides breeding territory information over the past ten years.

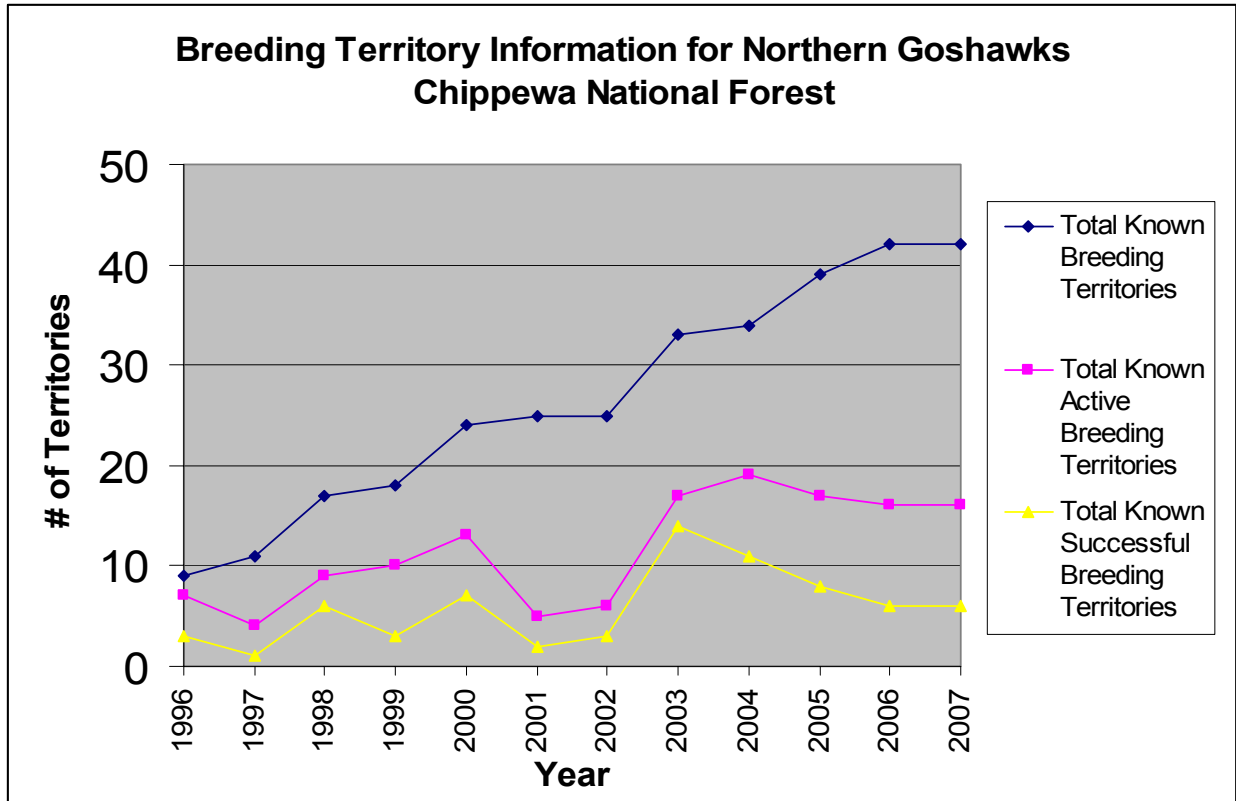


Figure 4. Territory Information

The population dynamics of the goshawk in northern Minnesota are not clearly understood at this time. The data provided is primarily based upon goshawk territories discovered during on-going field operations on the CNF. Therefore, there may be some bias in how territories are found, the habitats they are found in and the results of their subsequent monitoring efforts. To more completely understand any long term monitoring data, their needs to be some level of randomized inventory of suitable nesting/breeding habitats.

The CNF will be participating in a cooperative effort to inventory northern goshawks across selected ecological landscapes in Wisconsin, Michigan, and Minnesota during the 2008 nesting season. This Bioregional Monitoring of Northern Goshawks in the Western Great Lakes includes the Chippewa, Superior, Ottawa, Hiawatha, and Chequamegon-Nicolet National Forests, along with the states of Minnesota, Wisconsin, and Michigan. It will use a peer-reviewed and pilot study-tested design and survey protocol outlined in the U.S. Forest Service's Northern Goshawk Inventory and Monitoring Technical Guide (Woodbridge and Hargis 2006). The goal is to produce an estimate of goshawk presence within the study area. This survey is critical to accomplishment of Regional Forester Sensitive Species direction, and will provide data needed to assess if concerns about forest management and fragmentation are warranted in the western Great Lakes.

The CNF Forest Plan includes an objective of sustaining 20-30 breeding pairs of northern goshawks. Based upon current direction in the Forest Plan, the number of breeding pairs and suitable habitat conditions are expected to increase. Future monitoring at both the nest site and landscape scales will confirm this expectation.

White Pine:

White pine was planted on 43 sites totaling 502 acres in FY2007. Only one site was planted using only white pine. On 42 of the sites white pine was one species planted in combination with other species. These combinations included Jack pine, white spruce and red pine. Often these mixtures were in blends of three or four species with the density of white pine averaging around 410 TPA. In all, approximately 35% of the seedlings planted on the Chippewa in FY2007 were white pine (~206,000). White pine was also seeded on 21 acres, about 2/3 of the seeding program (11 acres of Jack pine were also seeded).

8. Timber

Monitoring Question:

Are harvested lands adequately restocked after five years?

Monitoring Driver:

(36 CFR 219.12(k)[5][i]. Lands are adequately restocked as specified in the forest plan.

Background:

National Forest Management Act (NFMA) regulations require that cutover lands be adequately restocked within five years. Stocking surveys on regenerated stands are conducted the first, third and fifth years after harvest to assess stocking levels. Regeneration may occur naturally or by planting or seeding.

Table 16: Regeneration treatments accomplished in FY 2007.

Reforestation Monitoring:

Table 16 displays various reforestation treatments that were accomplished on the Forest in FY 2007, including release and animal damage control to establish vegetation.

One hundred seventy-six stocking surveys were conducted on 2,593 acres in FY 2007. These surveys are done during the first, third and fifth years following reforestation

treatment. Natural regeneration may be certified following the third year survey and artificial regeneration may be certified following the fifth year survey, if adequate regeneration has been established following objectives in the Forest Plan and the specific silvicultural prescription. Certification indicates a site has been adequately regenerated following a regeneration harvest.

Fifty-two survival surveys were conducted on 838 acres. Survival surveys are conducted on plantings to follow the survival rate of individual seedlings over time. It is Forest Service policy to monitor both stocking and survival, and determine the causes of mortality. By doing this it is

Regeneration Treatments	Acres
Planting	847
Seeding	34
Site Prep for Natural Regeneration	942
Nat'l Regeneration without Site Prep	224
Site prep for planting or seeding	252
Release and Weeding	1,549
Pruning	223
Animal Damage Control	2,810
Total Regeneration Treatments	6,882

possible to adapt management practices from the nursery to the forest and improve the success of reforestation using planted seedlings. Protocols followed by the Chippewa for stocking and survival surveys are found in the Forest's supplement to the Forest Service Handbook, R9 Chippewa 2409.17-2007-1 dated April 30, 2007. Stocking survey data is collected on personal data recorders using common stand exam protocols. The data is downloaded into FS Veg and then used to update stand attributes as well as complete stocking surveys in FACTS.

Survival surveys are conducted during the first and third years following planting and are reported by species in FACTS. Results from the FY 2007 survival surveys follow in Tables 17 and 18. In 2007, overall survival for the first year surveys was 73%, and 61% for third year surveys. Mortality is primarily due to a sustained drought over the past two years (see Drought Monitor map, Figure 5). Poor survival of seedlings does not mean these sites are inadequately stocked as other acceptable species from natural regeneration may also be contributing to overall stocking. Stocking surveys monitor only the survival of planted seedlings.

Table 17. First year survival survey results for plantings done in 2006.

MONTH/YR		TYPE OF	TOTAL ACRES	AVERAGE TREES/AC	NUMBER OF TREES	NUMBER OF TREES	WEIGHT	AVERAGE WEIGHTED SURVIVAL %
PLANTED	SPECIES	STOCK	PLANTED	PLANTED	SAMPLED	ALIVE		
May-06	Jack pine	3-0	106	1,002	230	177	82	77
May-06	white spruce	3-0	109	742	170	135	88	81
May-06	red pine	2-0	157	429	165	113	104	66
May-06	white pine	3-0	109	498	150	106	76	70
TOTALS			481		715	531	350	73%

Table 18. Third year survival survey results for plantings done in 2004.

MONTH/YR		TYPE OF	TOTAL ACRES	AVERAGE TREES/AC	NUMBER OF TREES	NUMBER OF TREES	WEIGHT	AVERAGE WEIGHTED SURVIVAL %
PLANTED	SPECIES	STOCK	PLANTED	PLANTED	SAMPLED	ALIVE		
May-04	Jack pine	3-0	126	784	120	89	97	77
May-04	red pine	2-0	139	702	160	74	69	50
May-04	white pine	3-0	417	545	570	357	251	60
TOTALS			682		850	520	417	61%

Evaluation and Conclusions:

To comply with the NFMA, areas treated with regeneration harvests need to be adequately stocked and certified within five years following harvest. Of 825 acres receiving final harvests

in 2002, 703 acres (85%) were successfully regenerated and certified by 2007. One hundred twenty two acres (15%) were not yet certifiable as of 2007.

Of the 122 acres not yet certified, 41 acres (25%) were delayed as a result of waiting for an opportunity to burn the sites for site preparation. These were the Lake 34 and Hazel sales. Lake 34 was eventually burned but the delay caused the stand to not yet be certifiable in 2007. The Hazel sale was never burned and mechanical site preparation was done in place of prescribed fire for site preparation. This site was then seeded in 2007. The remaining 81 acres (75%) are on trajectory, but were not certifiable as of 2007, largely due to difficulties related to drought and/or deer predation.

9. Insects and Disease

Monitoring Question:

Are insects and diseases populations compatible with objectives for restoring or maintaining healthy forest conditions?

Monitoring Driver:

(36 CFR 219.12(k)[5][iv]. Destructive insects and disease organisms do not increase to potentially damaging levels following management activities.

D-ID-3 Native insects and diseases are present and fulfilling their ecosystem function. Epidemics, when they occur, do not last longer than would be expected in a healthy ecosystem.

O-ID-1 Increase the amount of forest restored to or maintained in a healthy condition to with reduced risk of and damage from fires, insects, and diseases.

D-VG-5 Vegetation constantly changes through management activities and through naturally occurring disturbances and ecosystem recovery processes such as wind, fire, flooding, insects, disease, and vegetation succession. These fluctuations are within an ecologically and socially acceptable range of variability.

D-VG-8 The ecological processes of native vegetation communities are maintained, emulated, or restored at multiple landscape scales to provide representation of their natural range of distribution and variation within context of multiple-use goals and ecosystem sustainability. These include: processes such as disturbance from fire, wind, flooding, insects and disease; biological community and species interactions; nutrient cycling; and vegetation succession.

O-VG-11 Increase amount of a variety of prescribed burning practices to restore the ecological process of fire and provide habitat for threatened and endangered species and other wildlife that benefit from or require burned vegetation.

O-VG-12 Retain an adequate representation of naturally disturbed forest that is not salvaged, such as burned, flooded, blowdown, or insect- or disease-killed areas. Maintain these in a variety of patch sizes and distributions on the landscape.

O-VG-13 Where natural disturbances, human influences, or stand age or composition have combined to perpetuate stands that are brush-dominated or have sparse tree canopy on sites that could otherwise provide productive timber management opportunities, and where there may be adequate ecological representation of these types of conditions, seek to re-establish adequately stocked stands to address timber management objectives.

Background:

Insect and disease populations and trends were monitored and reported annually under the 1986 Forest Plan. Past Monitoring and Evaluation Reports discuss agents, changes in populations and the need for management actions. The 2004 Forest Plan also identifies this as an annual item to be monitored and reported.

Monitoring Activities:

Each year in July the Minnesota Department of Natural Resources (DNR) conducts aerial surveys to monitor forest health. This aerial survey is used to monitor the most apparent effects of damage agents to forest health.

Evaluation and Conclusions:

Table 19: Acres within the boundary of the Chippewa NF affected by agent, forest type and severity. Differences in acre totals between categories is due to rounding.

AGENT NAME	ACRES AFFECTED 2007	ACRES AFFECTED 2006	ACRES AFFECTED 2005	ACRES AFFECTED 2004
Aspen defoliation	5,107	0	0	0
Unknown	1,685	509	198	3,998
Spruce Budworm	837	0	0	155
Larch casebearer	378	255	351	83
Jack pine budworm	222	2,322	1,368	274
Eastern larch beetle	142	0	0	0
Ash decline	102	0	0	0
Flooding/Beaver	47	148	258	22
Bark beetles	0	4	0	0
Larch beetle	0	250	0	0
Porcupine Damage	0	0	2	13
Two-lined chestnut borer	0	0	341	0
Abiotic	0	0	912	0
HOST FOREST TYPE				
Aspen	5,107	0	912	656
Hardwoods	1,469	411	75	1,736
Balsam Fir	626	42	0	155
Tamarack	519	560	733	696
Jack Pine	243	2,322	1,346	274

Softwoods	242	141	0	3
Black Spruce	211	0	0	0
Black Ash	102	0	0	366
Red Pine	0	13	24	16
Oaks	0	0	342	0
Birch	0	0	0	222
Unknown	0	0	0	423
SEVERITY				
Trace	2,152	673	257	2,339
Light	6,328	541	3,133	1,994
Moderate	39	2,246	12	46
Heavy	0	29	30	167

The 2007 survey results for the Chippewa National Forest are summarized in Table 19. These aerial surveys record currently active damage. For example, the oak killed by two-lined chestnut borer in 2005 are still dead. However, no new damage to oaks was observed in 2006 or 2007.

Drought: Many agents affecting forest health are opportunistic. Stressed trees are more vulnerable to these agents, and drought causes stress. In May, Dr. Mark Seeley, Professor of Meteorology/Climatology at the University of Minnesota, stated that the 2006 drought would end if 150% of the normal precipitation would fall in June, July and August of 2007. Though spring rainfall on the Chippewa NF was plentiful, by June the rainfall declined and summer months were very dry. On Sept. 4, 2007, most counties north of the Minnesota River were in some stage of long term drought in the federal Drought Monitor Map (Figure 5).

Aspen defoliation: The aerial survey found 73,200 acres of aspen defoliation statewide, and 5,107 acres on the Chippewa NF. No acres were reported on the Forest in 2006, 2005 or 2004. All defoliation on the Forest was classified as “light”. Late season ground

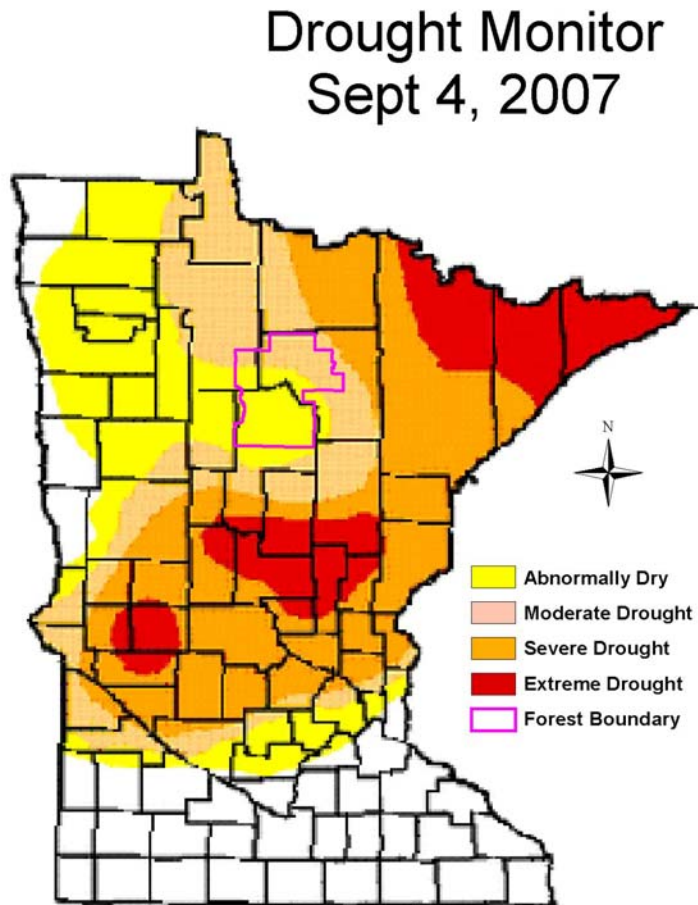


Figure 5. Drought monitor map showing the boundary of the Chippewa National Forest.

truthing was unable to pinpoint a cause. There was evidence of leaf rollers and leaf eaters, but not enough to explain the amount of defoliation. To the north in Ontario large aspen tortrix caused a couple large areas of defoliation. It is possible an early season defoliator like the large aspen tortrix was involved in Minnesota, but pupal cases were not found. Surveyors speculated an early aspen leaf roller complex may have been responsible for defoliation in Minnesota.

Unknown: The “unknown” agent category involved 31,438 acres statewide with 1,685 acres on the Chippewa NF. Of these, 1,422 acres were hardwoods, 242 acres were softwoods and 21 acres were jack pine. Causes for this dieback and mortality have not been determined, but it’s likely that a combination of factors are involved including drought in 2002-2003 and again in 2006-2007, forest tent caterpillar defoliation in 2000-2003, along with site factors and age. Most of the unknown dieback and mortality on the Chippewa NF was categorized as “trace” to “light”.

Spruce budworm: Spruce budworm made an appearance in 2007 with 837 acres being affected. No acres were found in the previous two years. In black spruce 211 acres were affected and 626 acres of balsam fir. The classification for defoliation in all the balsam fir, found in one large area, was “trace”. All areas of affected black spruce were classified as “light”.

Larch casebearer: Larch casebearer is an exotic insect which reached the Lake States in the 1950’s and is now considered to be “naturalized”. In 2007, slightly more than 10,000 affected acres were found statewide during the aerial survey. On the Chippewa NF, 378 acres were found with 350 of those categorized as “light” and 28 acres as “moderate”. This level is consistent with the previous two years.

Jack pine budworm: Jack pine budworm defoliated 17,320 acres of jack pines across the northern counties of Minnesota in 2007. This is down from over 70,000 acres in 2006. The affected acres on the showed a similar dramatic drop with only 222 acres showing signs of defoliation. This was down from 2,322 acres in 2006. All 222 acres showing defoliation in 2007 were classified as “light”.

Damage by other agent: Damage by other agents shown in Table 19 are minor and within endemic levels. These will continue to be monitored from year to year but do not warrant further discussion at this time.

Emerald ash borer (EAB): Emerald ash borer has not yet been detected on the Chippewa NF or in the State of Minnesota. Minnesota Department of Agriculture has 1,350 detection trees in place (1,225 created in 2007 and 125 created in 2006). These girdled trees are used as a sink for the EAB by attracting the insect. Three of these, created in 2006, are located at Stoney Point Campground on the Chippewa National Forest. One of these was cut and peeled and found to be negative for EAB. The remaining two will be peeled in the autumn of 2008 to look for signs of EAB in the phloem. Sites at Clubhouse, Cut Foot Horse Camp, Deer Lake, Knutson Dam Recreation Area, Mabel Lake, Mosomo Point, Noma Lake, North Star, Norway Beach Recreation Area, Onegume, Plughat Point, Tamarack Point, Seelye Bay (East and West), South Pike Bay, Stony Point, Webster Lake, Williams Narrows, and Winnie were all visually inspected by NA State & Private Forestry, for EAB, and found negative.

As time passes Emerald ash borer becomes an increasing threat to the Forest's ash resource. This non-native invasive has been the focus of continued coordination and strategizing in Minnesota in 2007. Partners, with the Minnesota Department of Natural Resources at the lead, have developed a strategy to limit the movement of firewood. This is a medium on which EAB is transported to new locations.

Gypsy moth: Gypsy moth is becoming an ever increasing threat to the Chippewa NF as the front where this pest has become established moves west. The Minnesota Department of Agriculture is responsible for monitoring Gypsy moths via a trapping program. Though trapped in 2006, no traps were set on the Chippewa NF in 2007. The Chippewa NF is in an area that is part of a rotating grid and may not be trapped again for 3-4 years (Figure 6). Minnesota has been trapping for Gypsy moth since 1973, and until recent years has been relatively "Gypsy moth free" with only low numbers of male moths being trapped and an effective eradication program in place. In 2007, over 21,000 gypsy moth pheromone traps were set statewide by MDA, and the highest number of male gypsy moths ever recorded were trapped. In total 3,604 moths were captured with the bulk being caught in Lake and Cook Counties in the far northeast corner of the State (3,038 moths). It's believed these increases may be attributed to increasing population pressure from western Wisconsin where populations have been building. As the gypsy moth front moves westward, trapping on the CNF will become more frequent. At this point in time MDA is focused on the moth activity in Lake and Cook counties, and trapping westward into St. Louis and Carlton counties.

Recommendations:

At this time, surveys, trapping results, and on the ground visits do not indicate upswings in population trends that warrant management concern or actions. However, vigilance in monitoring is warranted with the pending threat of both gypsy moth and emerald ash borer. Silvicultural guidelines are being developed to prepare stands, reduce populations, and minimize loss due to EAB when it arrives.

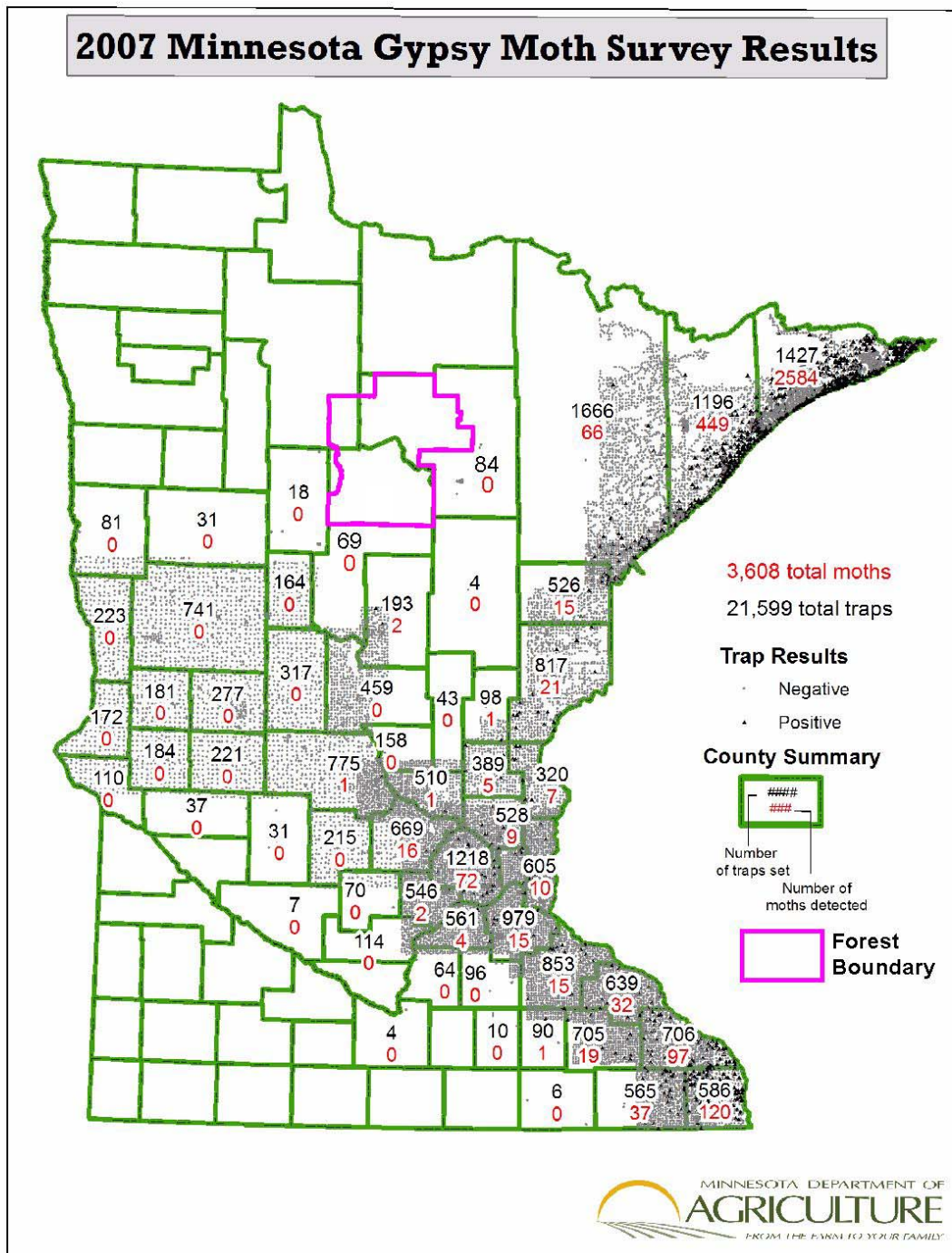


Figure 6. Location of 2007 Gypsy moth traps. Number of traps set and number of male moths caught are shown for each county where trapping occurred.

10. Fire

Monitoring Question:

How, where, and to what extent will prescribed fire be used to maintain desired fuel levels, and/or mimic natural process, and/or maintain/improve vegetation conditions, and/or restore natural process and functions to ecosystems?

This report is focused specifically on the response of blueberry plants to harvest treatments and prescribed fire. The desired conditions and objectives have been narrowed to those that would apply to the focus of the monitoring.

Monitoring Drivers:

D-ID-5 Fire is present on the landscape, restoring or maintaining desirable attributes, processes, and functions of natural communities.

O-ID-2 Establish, maintain, or improve the condition of vegetation conditions using prescribed fire, mechanical treatments, and other tools.

O-ID-4 Reduce fuels and control vegetation in the understory of stands that have historically had naturally occurring low intensity surface fires.

Background:

Blueberries are a traditionally gathered resource that was much more common decades ago than now (according to verbal accounts from local residents). A common theme in discussions with the public about vegetation management projects is the need to increase the production of native blueberries. In an attempt to do this, in the Sand Plains project (2003) several stands were planned for harvesting (thinning and shelterwood cutting) and burning that would favor blueberry plant growth. Objectives in the Sand Plains project included: use fire to enhance blueberry resources and to reduce competitive vegetation, and improve forest conditions to support traditional uses and subsistence gathering opportunities. Harvesting has been accomplished in four stands and monitoring plots were installed. The residual trees are large enough to withstand understory burning. Introducing fire into these stands would maintain fairly open stands with reduced brush competition, which should provide good areas of blueberry production.

Monitoring Activities:

Four sets of plots for monitoring changes in blueberry production were established in 2004 in four stands on sandy soils near Cass Lake. (A fifth set of plots are in stands that are yet to be harvested.) Two of the stands had been harvested prior to establishing the plots and they subsequently received mechanical scarification for site preparation (one was also burned), so the effect of this can be seen on the blueberries. No further treatments are planned. The third stand is the best of the blueberry stands. It was harvested shortly after the plots were established but is still waiting for the prescribed burning which is now planned for FY 2008. The fourth stand was just harvested in 2007 so only was included in plots taken in 2004 and 2007.

Monitoring by Forest Service personnel occurred in July/August of 2004, 2005, 2006 and 2007 when plants are easily visible. Numbers and sizes of plants were counted in 223 plots. Comparisons between years was made for the number of plants in the plots and for the number of plots that contained plants to see if new plants were becoming established and if old ones grew. One stand was sampled in 2004 and 2007, two of the four years, because it was not harvested and would not give useful results in the other two years.

Data collected has been entered into a local spreadsheet since a corporate database is not available.

Evaluation and Conclusions:

Table 20. Number of plots with blueberry plants by year.

	2004	2005	2006	2007
Total Blueberry Plants on Plots	119 (157)*	75	59	122 (131)*
Total Plots with Blueberries	39 (48)*	31	20	42 (48)*

* Includes the fourth stand that was not cut until 2007.

As the above table shows, the number of blueberry plants and the number of plots with blueberry plants decreased from 2004 to 2006, but then a increase in 2007. The loss over the first 3 years appears to be attributable to scarification damage from logging (three stands) and site preparation (one stand). However, the major cause of the loss seems to be that no burning has been done in two of the three stands, so the shrubs, grass, and forbs have become quite dense. Prescribed burning was limited the last two years by drought conditions that prevented the ignition of prescribed burns. The dense understory has smothered some of the plants and prevented any new ones from becoming established. In 2007 there was a large unexplained increase in the number of blueberry plants. There was not an abundance of plants at the beginning, even though these are stands with sandy soil and pine overstories that should be good for blueberries. Sizes of plants did not change enough to measure so is not reported.

The conditions of the overstory after the harvesting are well-suited for blueberries, but the dense understory counteracts this. The objective of increasing blueberry production has not been met in this area because the full range of prescribed treatments has not been implemented. There was an increase in plants but not an apparent increase in berry production with the plants remaining quite small.

Recommendations:

The remaining prescribed burning should be conducted. The assumption is that without fire the objectives for blueberry production will not be met. The monitoring schedule should be extended to continue monitoring for at least two years after burning is complete. Based on the results of treatments on blueberry production, harvest and post-harvest activities used to promote blueberries should be re-evaluated.

Refer to Chapter III, Research and Studies, Red Pine Retention Study, for a brief summary on blueberry management. *Blueberry Management in North Central Minnesota Red Pine (Pinus resinosa) Dominated Silvicultural Systems*, Mike Reinikainen, 2007.

11. Soils

Monitoring Question:

Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?

In 2007, the focus of monitoring was on nutrient retention. Monitoring for nutrients is conducted on a three year rotation; with soil compaction and soil erosion being conducted in the other years (refer to the FY 2006 and 2005 M&E Reports for details on soil compaction and erosion monitoring).

Monitoring Driver:

From the Chippewa National Forest 2004 Land and Resource Management Plan:

D-WS-12 The first three sentences read: Soils recover from natural disturbance events and absorb the effects of human disturbances without reducing productivity and function. Soils contribute to ecosystem sustainability. Soil-hydrologic function and productivity is protected, preserving the ability to serve as a filter good water quality and regulation of nutrient cycling.

O-WS-9 Protect and restore areas where soils are adversely impaired and contributing to an overall decline in watershed condition, soil productivity, soil quality and soil function. Do this by using management practices, inventory and monitoring results and findings from the inventory of ecological units.

O-WS-10 During all management actions involving soil disturbance:

Two of the statements are:

- “Minimize soil displacement, nutrient loss, and effects of severe burning.”
- Provide for the maintenance of physical, chemical and biological properties of the forest floor (soil organic matter, surface O layer) that make soil productive.

G-WS-10 On low-nutrient sites (ELT group 1 and phase group 9) maintain soil productivity by:

- Retaining or returning fine slash (< 3inch diameter) well distributed over the site;
- Maintaining or converting to pine type;
- Meeting vegetation objectives for older growth stages.

From the Voluntary Site-Level Forest Management Guidelines (MN Forest Resource Council, 2005):

An overview of Forest Soil Productivity is provided in: Rationale for Guidelines, Forest Soil Productivity. Guidelines for well drained, sandy soils are on page 15 of the Timber

Harvesting chapter and pages 22 and 23 of the Forest Biomass Harvesting chapter. The Forest Biomass Harvesting chapter is a recent addition to the 2005 guidelines. Although recommendations for droughty sand soil types have been modified to allow the removal of more biomass on those soil types, Chippewa Forest Plan G-WS-10 is followed because “Forest Plan standards and guidelines take precedence over the MFRC guidelines in any situation where management direction from these two sources appears to conflict” (p. 1-6).

Background:

In the past there have been concerns over the amount of nutrient removal that occurs on a logging site, especially low-nutrient sites. In certain instances the topsoil and vegetation were bulldozed into piles called windrows. This was done to facilitate planting for pine and spruce plantations. That practice of pushing the topsoil into piles called windrows is no longer being used on this Forest. Today the practice of removing a portion of the above ground woody biomass for site preparation for planting tree seedlings or to stimulate natural regeneration of aspen and reduce fuel loading is being utilized after some timber harvests.

For this report, monitoring focused on nutrient retention on low nutrient sites. There are about 96,418 acres or 15% of soil types that meet the criteria for low-nutrient soils on the Chippewa National Forest. These are the well drained to excessively well drained deep sands. As specified in G-WS-10, there are 3 aspects that will be discussed.

- Retaining or returning fine slash (< 3inch diameter) well distributed over the site;
- Maintaining or converting to pine type;
- Meeting vegetation objectives for older growth stages.

In 2007, biomass harvesting for energy production was used on a limited basis on the Chippewa National Forest. This involves the removal of woody debris after a timber harvest which is of concern on low nutrient sites.

The previous forest plan did not have a guideline that required fine woody debris be retained after a harvest on low-nutrient sites.

Monitoring Activities:

Monitoring was done in September 2007 by the Forest Soil Scientist and Hydrologic Technician. Sites were selected by using an ArcMap GIS project that was built using a Terrestrial Ecological Unit (TEU) layer and a layer which showed harvested timber stands in the past 3 years. In addition, harvested stands had to be planned under the 2004 Forest Plan. Clearcuts were the only sites selected due to the amount of wood that is removed. Four sites were eventually identified and monitored, but only two met the soil type and harvest requirements. Only the two sites that qualified will be reported here. Both sites occurred on the Deer River District. Site #1 was in the vicinity of the town of Max; Site #2 (Figure 7) was near Forest Road 2127, south of State Hwy 2. They were covered by the Round Island Resource Management Project and the Mississippi Vegetation Management Project, respectively.

Methodology consisted of walking over the site and looking at the amount of fine slash less than 3 inches in diameter left on the harvest unit. Photographs were taken of the remaining slash and of the stand in general. Measurements of the amount of slash remaining were not taken since our objective was to determine if the guideline to leave the three inch slash or less was being followed.

A more detailed report and an Excel spreadsheet will be maintained which lists the stands that were monitored, what they were monitored for and what was found on the site.



Figure 7. Site #2 near Forest Road 2127, south of State Hwy 2.

Evaluation and Conclusions:

For Site #1 the fine slash appeared to have been retained or returned to the site.

For Site #2 not all of the slash less than three inches remained. This was due to biomass harvesting. This involves putting the fine and coarse woody debris into piles and material from the piles loaded into a grinder which was hauled away to be burned. Some of the fine slash was used for that purpose. The amount of slash was not evenly distributed; there was patchy distribution with significant amounts of slash remaining in some areas in the stands.

All of the clearcuts sampled had reserve areas and individual reserve trees, both dead and alive, that remained on the site (Figure 7). As trees, branches, needles and leaves fall to the ground, biomass of different size dimensions will be added to the forest floor.

Because only two sites actually met the criteria of a clearcut on a low-nutrient site, the sample size is very small. Therefore it is difficult to come to a conclusion about the effectiveness of the

guideline requiring fine slash to remain after a harvest. The following was noted with regard to Forest Plan guideline G-WS-10.

- Retaining or returning fine slash (< 3inch diameter) well distributed over the site:
Fine slash was retained on Site #1.
Where biomass harvesting occurred, this guideline was not met throughout the stand. There was some patchiness, but the slash was not concentrated near the landing. To have the remaining slash well distributed throughout the stand is a challenging task. Perhaps changing the guideline to say “as well distributed as possible over the site” would be more realistic.
- Maintaining or converting to pine type;
Both sites are scheduled to be planted to a pine type which is a tree species that does not use as many nutrients as hardwoods or aspen.
- Meeting vegetation objectives for older growth stages
This determination is made at a landscape ecosystem level during the project planning process. Depending on the age class, the Mississippi Vegetation Management Project appeared to be meeting or is making progress towards meeting the older age class objectives. There was a slight reduction in meeting the older age class objectives for the Round Island Resource Management Project.

Recommendations:

- Monitor other types of harvests, such as shelterwood cuts, select cuts and thinnings on low-nutrient sites. Clearcuts should still be a priority due to the amount of nutrients that are removed.
- Site preparation for tree planting or seeding after a timber harvest should be evaluated for the amount of slash removal necessary to achieve the overall vegetation objectives.
- Site selection method should be reviewed to ensure all the harvest sites meeting the low-nutrient criteria are in the sample pool. The protocol used in the sampling should be reviewed for effectiveness.
- Create a partnership with Itasca Community College, Bemidji State University or Leech Lake Tribal College to assist with developing a protocol for choosing sites, gathering data, taking field measurements and analyzing data.
- Support the continuation of the Long-term Soil Productivity (LTSP) study which will provide information about the long-term effects of organic matter and coarse woody debris removal.
- Encourage long-term research of the nutrient levels of low-nutrient soil types on the Chippewa National Forest. What were the historical nutrient levels? Can a research station or university help the Forest with the research?
- Support the acceleration of the Terrestrial Ecological Unit Inventory. A more precise inventory would be helpful in identifying stands with low-nutrient sites.

12. Watershed Health and Riparian

Monitoring Question:

To what extent is Forest management affecting water quality, quantity, flow timing and the physical features of aquatic, riparian, or wetland ecosystems?

Monitoring Driver:

D-WS-1 Watersheds and their components:

- Are part of healthy ecosystems that meet the needs of current and future generations
- Provide for State, tribal, and local beneficial uses
- Are protected or enhanced to provide for unique plant and animal communities, special habitat features, habitat linkages, wildlife corridors, aquatic ecosystems and riparian ecosystems.

D-WS-2 Water-related recreational, subsistence and commercial uses (such as access for powered or non-powered watercraft; opportunities and access for activities such as fishing, swimming, camping, wild rice harvesting, and aesthetics) are provided for within the limits of aquatic ecosystem capability.

D-WS-3 Watersheds and soils are maintained or restored in a way that allows for the conservation of the genetic integrity of native species. Physical properties of soils are maintained and enhanced. Watershed and habitat restoration projects are natural appearing and favor the use of native materials or naturalized species to the extent practical.

D-WS-4 Management activities do not reduce existing quality of surface or groundwater or impair designated uses of surface and groundwater.

D-WS-5 Water quality, altered stream flow, and channel stability do not limit aquatic biota or associated recreational uses. Water in lakes, streams, and wetlands meets or exceeds State water quality requirements.

D-WS-6 Watersheds provide an appropriate quantity, quality, and timing of water flow. Stream channels and lakeshores are stable. Stream temperatures are maintained within their natural range and are not increased by lack of shading or because of channel instability. Stream channels, including those in wetlands, are able to transport water and sediment without changing their pattern, dimension, and profile. Sensitive stream types are protected and improved. Management activities protect or promote quality of habitats that occur in the riffle areas of streams, improving stable channel characteristics.

D-WS-7 The physical integrity and hydrologic connectivity of pool depressions in seasonal ponds is maintained to assure seasonal retention of water.

D-WS-8 Hydrologic connectivity of aquatic ecosystems and wetlands is maintained or restored to assure passage of water, sediment, nutrients, wood, invertebrates, and fish and to facilitate freshwater mussel dispersal. The number of impoundments is minimized. Waters affected by dams are managed as much as practical to mimic natural lake levels and seasonal flows. Stream

flows and lake levels on waters not affected by dams are suitable to protect habitat and maintain natural hydrologic processes.

D-WS-9 Fine sediment from management activities does not adversely affect lake, stream, and wetland habitats. Macro-invertebrates are represented in the approximate proportion expected for high quality waters. Fish habitats are in good to excellent condition and are spatially distributed and connected to allow stable populations of fish, reptiles, and amphibians to persist within their natural ranges. Natural reproduction of fish is not limited by habitat condition.

D-WS-10 Riparian areas serve as landscape connectors. Riparian areas, habitats, and associated vegetative communities are diverse in composition and structure and support native and desired non-native wildlife and plant species appropriate to site, soil, and hydrologic characteristics. Plants are present at a variety of ages and sizes and at densities adequate to provide bank stability. Where suitable to the site, a multi-layered forest canopy is present in the riparian area, providing shade, leaf-litter, and coarse woody debris to lakes, streams, and wetlands. Some of these sites have an overstory of conifer that provides shade for aquatic and wetland ecosystems and thermal cover for wildlife. Super canopy trees provide nest sites for riparian associated species. Openings in riparian area vegetation resulting from road crossings, trails, campsites, water access, or other recreational uses, occur infrequently and result in minimal alterations of riparian ecological function.

D-WS-11 Riparian ecosystems filter runoff. Some of the mature and decadent trees from riparian ecosystems have fallen into lakes, streams, and wetlands, providing bank stability and habitat complexity. Other mature and decadent trees are retained in the riparian ecosystem, providing habitat for amphibians and other species and a reservoir of large wood to supply aquatic and wetland systems.

D-WS-12 Soils recover from natural disturbance events and absorb the effects of human disturbances without reducing productivity and function. Soils contribute to ecosystem sustainability. Soil-hydrologic function and productivity is protected, preserving the ability to serve as a filter for good water quality and regulation of nutrient cycling. Soil exposure is minimized. There is minimal compaction, displacement, and puddling. Severely burned conditions resulting from management-ignited fire occur infrequently.

O-WS-1 Improve and protect watershed conditions to provide the water quality, water quantity, and the soil productivity necessary to support ecological functions and intended beneficial water uses.

O-WS-2 Restore ecological integrity on all or parts of one or two of the Forest's fifth level watersheds per year by:

- Enhancing or re-establishing the natural ecological process and diversity of riparian areas (aquatic ecosystems, riparian ecosystems, and wetlands) on National Forest System land.
- Improving road and trail crossings of streams and wetlands to assure soil stability, unimpeded flow, sediment transport, and/or passage of fish.

- Characterizing the ecological composition, structure function, and patterns of individual lakes, streams, wetlands, upland and lowland soil (terrestrial ecological classification units) and the watersheds and landscapes in which they are nested.

O-WS-9 Protect and restore areas where soils are adversely impaired and contributing to an overall decline in watershed condition, soil productivity, soil quality and soil function. Do this by using management practices, inventory and monitoring results, and findings from the inventory of ecological units.

O-WS-10 During all management actions involving soil disturbance:

- Maintain adequate ground cover and soil organic layers, both during and after treatment, to minimize erosion (including rill and gully formation) and allow water to infiltrate the soil.
- Minimize soil displacement, nutrient loss, and effects of severe burning.
- Restore and re-vegetate disturbed areas.
- Provide for the maintenance of physical, chemical and biological properties of the forest floor (soil organic matter, surface O layer) that make soil productive.
- Protect soil-hydrologic functions by minimizing rutting, puddling, and compaction.
- At the project level, this objective does not apply to the portions of disturbed areas that, by design, are converted long term or permanently to a non-productive condition (such as gravel pits or the actual compacted or paved surfaces of all season roads or trails, parking lots, or water access ramps).

Background:

Forest Plan direction calls for maintenance, enhancement, and restoration of watershed conditions (USDA 2004). Forest management activities can potentially affect watershed conditions in a number of ways. Activities designed to improve conditions are carried out by multiple programs and with various partners. Actions not directly tied to watershed improvements are carried out in such a way that, at a minimum, maintains watershed conditions. This is largely done by following Best Management Practices (BMPs) in the Forest Plan and the Minnesota Forest Resources Council Gold Book (MFRC 2005). Monitoring actions undertaken in FY 2007 addressed watershed improvement projects, and BMPs related to vegetation management.

All monitoring data are at present being stored on the Forest. Efforts are being made to input this data into national database, but such a database has yet to be fully developed.

Monitoring Activities:

Woodtick Trail Wetland Restoration

In June of 2004, roughly 21 acres of wetlands were restored after relocating about 3,500 feet of the Woodtick Trail. Since then, the site has been monitored annually for the last three years. According to the project EA, we will monitor this site annually until 2014.

Some sedimentation occurred during construction and had all but subsided within a month after project completion. Quantities were within estimates discussed in the Woodtick EA (USDA 2002) and therefore had little negative impact on the surrounding wetlands.

As of 2007, nearly all wetland indicators of restoration have been met (USDA 2002). Plant species diversity and composition continue to improve annually. Pine has been planted the last two years in surrounding uplands, but unfortunately few have survived in subsequent growing seasons. Deer browse and damage by cross-country ATV use are likely culprits. A larger sign stating the area is closed to motorized travel and inexpensive efforts to dissuade deer browse will be tested in 2008.

FR 2076 Wetland Restoration

In June 2006, roughly 20 acres of wetlands were restored after ripping and recontouring about 0.3 miles of Forest Road 2076.

It's too early to determine whether restoration has been successful. However, all monitoring criteria including percent vegetative cover, percent of wetland species present and surface water flow patterns for year one have been met (Morley 2007), therefore the site is likely trending toward the desired condition. Wetland hydrology, vegetation, and soils appear to have improved from conditions prior to construction and the road closures have effectively eliminated any cross-county vehicle access. This site will be monitored in future years to determine long-term site conditions.

FR 3790C Obliteration

In late summer 2006, roughly 1.2 miles of Forest Road 3790C was obliterated via ripping, recontouring, removal of water control structures, and closed with berms.

During construction, sedimentation and soil compaction occurred in excess of expectations based on ocular observations, mainly due to a lack of operation planning by the contractor. As a result, vegetation took longer to become established. However, there appeared to be little impact to water quality due to a scarcity of surrounding water features. The ability of the soil to support trees, shrubs, and forbs will be evaluated in future years.

Closures consisting of berms, boulders and slash at two main entry points effectively eliminated access by HLVs (Highway Legal Vehicles) or OHVs. However they had little impact on ATV access. Continued ATV traffic also prolonged the time it took for vegetation to become established. In October 2007, the main closures were supplemented with several large boulders. Their success in restricting ATV access will be re-evaluated in 2008.

Vegetation Management Best Management Practices Evaluation

Eleven timber sale units were reviewed post-harvest from September through October of 2007. Evaluations regarding water quality followed draft BMP monitoring protocols developed by the Forest Service Vegetation BMP Monitoring Task Group. Protocols for monitoring soils and riparian health were developed by modifying existing MFRC protocols to answer Forest-specific questions. Key findings related to soil productivity, water quality, and riparian health consisted of the following:

- Only two of the eleven units had observable rutting because frozen soil operation restrictions were not implemented. This rutting however, was limited in extent and did not exceed Regional standards. Where seasonal restrictions were applied, rutting was not observed. In another unit, frozen soil restrictions were waived by a FS hydrologist due to drought conditions; no rutting was observed.
- On roughly half the units, the boundaries of the sale area were located within filter strips. This was satisfactory in most circumstances because of seasonal harvest restrictions and the use of slash, which was effective at controlling soil erosion and movement of sediment into adjacent water features. Two sale units harvested in the summer had observable impacts where soils were exposed by equipment operation on moderately steep slopes and sedimentation into the downslope wetland was evident. However, this area was limited in extent and met Forest and MFRC standards for soil exposure in filter strips.
- Riparian area harvest restrictions were met on all applicable units by deferring nearly all activity within riparian management zones. Areas that did not meet species and age class objectives in the Forest Plan (USDA 2004) or were below basal area and coarse woody debris recommendations (MFRC 2005) were inherent to the site and not a result of management activities.
- Monitoring of a couple of harvest units identified in the Sand Plain EA was conducted to meet direction included in a formal appeal resolution in 2003 for that project. This was the 4th year of a 5 year commitment to monitor riparian areas in stands covered by the Sand Plain EA. Previous monitoring has been included in earlier M&E Reports. In FY 2007, two units with wetlands within or adjacent to the cutting unit boundary were monitored. Filter strips and residual basal areas for trees were met. Soil disturbance was not evident or less than 5%. Wetlands were not crossed during harvest operations. There was no operator generated slash in the wetlands. Both units complied with guidelines in effect at the time implemented.

Riparian Planting

Two riparian units were planted in early May on the Blackduck District. The EA identified a clearcut, site prep and planting of pines. The first unit along Rice Lake had been harvested and then site prepped in the winter when the ground was frozen. The treatment knocked the brush down, made it easy to plant, but did not create any soil disturbance. A mix of pine and spruce was randomly planted across the site.

The second site was a meandering clearcut along Kitchi Lake. The cutting unit boundary was well back from the lake, leaving a nice wide swath of mixed pine and hardwood trees down to wetland edge and then the lake. There was little soil disturbance, lots of down woody debris, and plenty of residual trees in the cutting unit. A mix of pine and spruce was planted in openings and throughout the unit. The stand will naturally regenerate to aspen with hopefully a nice component of pines.

Implementation was well done and will likely have a positive effect to the riparian area.

Evaluation and Conclusions:

Monitoring results presented above and in other sections of this report show that Forest management is meeting the goal of maintaining or improving watershed conditions. Wetland vegetation, hydrology, and soils conditions are improving as desired in the watershed improvement project areas. Post-harvest conditions on vegetation management sites are meeting Regional, Forest and MFRC guidelines.

Projects included in this report were effectively implemented following BMPs to protect water quality and watershed resources. The monitoring protocols appear to be sufficient in providing the Forest with adequate data to determine post-project conditions. However, these protocols along with storage of such data will likely evolve in the future. National protocols for monitoring BMPs are being developed by the agency to meet requirements of the Environmental Protection Agency (EPA).

Monitoring efforts will continue annually in the future to meet Forest Plan requirements. Annual efforts will include monitoring BMPs on vegetation management projects and post-project conditions on watershed restoration sites. The number of sites monitored will be determined in part by available funding and resources.

Recommendations:

- Continue monitoring of activities that contribute to watershed improvements such as wetland restoration, road obliterations, and road closures.
- Continue monitoring of BMPs in harvest units.
- Monitor riparian plantings to determine survival and success and whether or not riparian objectives are being met.

References

- USDA Forest Service. 2002. Final Environmental Impact Statement: Woodtick Trail (Forest Road 2107) Relocation. Cass Lake (MN): USDA Forest Service Chippewa National Forest.
- USDA Forest Service. 2004. Land and Resource Management Plan. Cass Lake (MN): USDA Forest Service Chippewa National Forest.
- Minnesota Forest Resources Council. 2005. Sustaining Minnesota Forest Resources: Voluntary Site-level Forest Management Guidelines. St. Paul (MN): Minnesota Forest Resources Council.
- Morley, David. 2007. Woodtick Trail Wetland Restoration Monitoring Report.

13. Resource Area - All

Monitoring Question:

Monitoring and evaluation requirements will provide a basis for a periodic determination of the effects of management practices. 36 CFR 219.11(d).

Monitoring Driver:

At intervals established in the plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards, guidelines, sale design features, and best management practices (BMPs) have been applied. Based upon this evaluation, the interdisciplinary team shall recommend to the Forest Supervisor such changes in management direction, revision, or amendments to the forest plan as are deemed necessary. (36 CFR 219.12(k)).

Background:

Informal monitoring of Forest Plan standards and guidelines, sale design features, and mitigation measures, and BMPs identified in the EA occurs at all phases of the timber sale design, layout and implementation. Periodically more formal monitoring trips are scheduled that involve an integrated team of specialists and district personnel. In 2007, four timber harvest units were monitored to see how well the project objectives were met, as well as Forest Plan standards, guidelines, project sale design features and mitigation measures, and BMPs. The monitoring team consisted of integrated team including a district ranger, forest planner and NEPA coordinator, timber sale administrator, timber specialist, district wildlife biologist, district hydrologist, forest soil scientist, operation and implementation team leader, silviculturist, and forest botanist.

Sites were selected from a list of timber sale units harvested within the last year on the Walker District. While not random, final site selections were not based on prior knowledge of the sites, but did consider logistics such as proximity of units, types of harvest, and ease of access by a group. The criteria were that the Decision Notice for the project was signed under the 2004 Forest Plan and harvest had been completed within the last year. Three cutting units were selected from the County 4 timber sale which was covered by the Leech Lake River EA and decision (signed 6/04). Two cutting units were also chosen from the Portage Timber Sale which was covered by the Walker Conifer Thin EA and decision (signed 11/04). Due to time limitations, only one of the Portage units was monitored.

The team was broken into four groups to address the following: wildlife, silviculture/vegetation, soils, and wetland/riparian. Each group was provided with maps, prescriptions, sale design features, and mitigation measures applicable to each unit. A briefing was provided on treatments planned, and timing of harvest activities, and difficulties or complications encountered during harvest. Team members spent 30 – 45 minutes looking at the stands, filled out forms, and met jointly to report out and discuss findings. The following is a brief overview of the results.

Monitoring Activities:

Site #1 – County 4 Timber Sale Cutting unit 8 Compartment 130 Stand 36

This was a mature aspen/balsam poplar stand with a low basal area. Clearcut with reserves was planned in the EA. Wetlands occur on the northern edges of the stand. All the aspen and birch were to be cut. Any oak was to be left. 5-7 aspen per acre were to be left for wildlife. A 2-3 acre legacy patch was to be left along the northern edge of the stand. Logging was to take place on frozen ground to protect the wetland resources. The photo below was taken in the unit. Note the amount of residual trees, the aspen seedlings, and coarse woody debris left on site.



Figure 8. Cutting unit 8.

Key Findings Site 1:

- Unit was harvested in January 2007. Trees were whole tree yarded to the landing. Harvest occurred on frozen soils.
- Silviculture/Vegetation -- The clearcut with reserves prescription as specified in the Leech Lake River EA was implemented. Aspen and birch were harvested. Oak, ash, and conifer were left on site. Reserve trees exceeded 5-7 per acre. Within a year after harvest, 3000-4000 stems per acre of aspen regeneration 5-6 feet high were present. No additional treatments were planned or needed. With regard to non-native invasive species, some tansy, thistle, and heavy clover occur on the landing site and temporary road that was obliterated. Equipment was cleaned prior to harvest. The clover probably migrated from the roadside or there was a seed bank in the soil that germinated after disturbance.
- Wildlife -- Ample green tree residuals and adequate snags (6-12) were retained. Legacy patch was marked to leave along north boundary. Efficiencies could have been achieved by pulling the cutting unit boundary back from impoundment/wetland during layout rather than marking trees to leave within the 300 foot riparian management zone (RMZ). Mitigation, as specified in the EA, consisting of leaving some white spruce available as a forage source for black-backed woodpecker and obliteration of temporary road for blanding's turtle was implemented.

- Wetlands/riparian-- A 300 foot RMZ with at least 80 sq ft of basal area, as required, was left around an impoundment on the north edge of the unit. There was no harvesting within the RMZ, consequently there was no soil disturbance or need for mechanical site preparation. Mitigation in the EA called for planting conifer but planting was not included in the prescription or KV plan probably because no harvesting occurred. There are seed producing conifers within the RMZ and the potential for natural regeneration.
- Soils – Area in skid trails was less than 10-15% of cutting unit. Size of landings and total amount of area in landings was acceptable and within the 1-3% guideline for units (Voluntary Site Level Forest Management Guidelines, Timber Harvesting section, p 26). Except for landings and skid trails, there were no visual signs of compaction, rutting, or erosion. A variety of sizes of coarse woody debris was retained and scattered across the site.
- In summary, management activities followed activities specified in the EA and met Forest Plan objectives, standards and guidelines. Administration of the sale was excellent and the resulting condition of the stand was very good.

Site #2 – County 4 Timber Sale Cutting unit 11 Compartment 130 Stand 11

This is a 26 acre, 78 year old mature aspen stand that had some blowdown in the center of the stand. The prescription was for a shelterwood harvest with a residual basal area of 50 sq ft per acre. Specified leave trees were basswood, sugar maple, oak and aspen. Planting of white pine was planned for 4 acres in the NW portion of the stand followed by tending activities to ensure survival. Logging was required on frozen or dry ground conditions in order to protect wetland resources. A wetland is located on the west and south sides of the stand. RMZ included a 300 foot filter along open water and a basal area of at least 80 sq ft per acre.

Key Findings Site 2

- Unit was harvested in October 2006 on dry soils. Frozen soil requirement was waived due to discussion with soil scientist and sale administrator.
- Silviculture/Vegetation --Harvest prescription was met for most part. Some areas were below desired basal area, but not sure if that was due to timber marking or from blowdown prior to sale layout. Planting of white pine, release, and regeneration surveys were all funded with KV. Establishment of white pine might be difficult due to understory aspen density. Non-native invasive species on landings or temporary road were minimal. The amount of logging slash retained to discourage road use and bare soil could provide conditions conducive to weed establishment in the near future.
- Wildlife –Legacy patches are not needed in shelterwood units. Numbers of green tree residuals were adequate. Stand is lacking 6-12 snags per acre, although these may have not been present in the stand prior to harvest. There is potential for future snags with the number of residual trees in unit. Conifers were left where they were available to provide

forage trees for black-backed woodpeckers. Obliteration of temporary road would benefit blanding's turtle.

- Wetlands/riparian—There were no signs of soil disturbance along the wetland even though buffers were not required. Planting of white pine may be difficult due to aspen densities and height.
- Soils – Area consisting of skid trails and landings is within the percentage guidelines (10-15% and 1-3%, respectively). No soil compaction, rutting or erosion noted except on skid trails and landings. Coarse woody debris generally adequate but larger diameter material is lacking in some areas. Temporary road was effectively closed and obliterated by placing slash on it. No sign of recent vehicle use.
- In summary, activities corresponded to those specified in the EA. Forest Plan objectives, standards and guidelines have been met. It may be difficult to achieve the desired white pine component on four acres of the stand due to competition from aspen regeneration.

Site #3 – County 4 Timber Sale Cutting unit 12 Compartment 130 Stand 10

This is an 18 acre, 71 year old basswood and sugar maple stand with a minor component of aspen and paper birch. Mature aspen occurs along the edges of the stand. The prescription was to commercially thin to a residual basal area of 90 sq ft per acre. Residual tree species preference was for basswood, then sugar maple with some aspen kept for diversity. Residual trees would meet the wildlife green tree requirements. The photo below shows the cutting unit in the background.



Figure 9. Cutting unit 12 in the background.

Key Findings Site 3

- Unit was harvested in January 2007 on frozen soils.
- Silviculture/Vegetation --Residual basal area was slightly below that designated in the prescription but other components of the prescription were met. Harvest is adding a young cohort of aspen and maple that was not anticipated but is desirable and will facilitate moving the stand toward a multi-aged hardwood stand with another harvest entry in 10-15 years. Tending and thinning of young cohort to manage density and spacing would be desirable. Non-native invasive species on landings or temporary road were minimal. The amount of logging slash retained to discourage road use coupled with bare soil could provide conditions conducive to weed establishment in the near future.



Figure 10. Unit is in the background. Slash placed across temporary road and landing.

- Wildlife –Legacy patches are not needed in commercial thinning harvests. Number of green tree residuals was adequate. Stand is lacking 6-12 snags per acre, although it is unlikely that these numbers existed prior to harvest. There is a potential for future snags with the number of residual trees in unit. Conifers were left where they were available to provide forage trees for black-backed woodpeckers. Obliteration of temporary road would benefit blanding's turtle.
- Wetlands/riparian— There were no wetlands or riparian areas within the stand.
- Soils – Area consisting of skid trails and landings is within the percentage guidelines (10-15% and 1-3%, respectively). No soil compaction, rutting or erosion noted except on skid trails and landings. Coarse woody debris generally adequate but larger diameter

material is lacking in some areas. Temporary road was effectively closed and obliterated by placing slash across it. There was no sign of recent vehicle use.

- In summary, activities corresponded to those specified in the EA. Forest Plan objectives, standards and guidelines for the most part have been met. Snags were limited in number as was larger diameter coarse woody debris in some places. Recruitment opportunities occur as portions of the overstory die and fall to the ground.

Site #4 – Portage Timber Sale Cutting Unit 3 Compartment 122 Stand 26

This was a 21 acre red pine stand with pockets of hardwoods. This dense stand was 48 years old and had not been previously thinned. Jack pine had died already. A few large remnant red pine occurred from the previous stand. The prescription called for varying the density of the residual trees across the stand (variable density thinning) from 60-120 sq ft per acre. All hardwoods, jack pine, white pine, and older, larger red pine were to be left to increase diversity. Gaps and unthinned patches were incorporated throughout the stand. Riparian area along Portage Creek occurred along the northern edge of the stand. Slash was to be removed along the road to reduce the fire hazard. Harvest on frozen or dry soil conditions was specified in the EA. Brush piles (2-4 per acre) were required for lynx habitat.

Key Findings Site 4

- The cutting unit was a long narrow unit that paralleled the road which made it difficult and expensive to harvest. With the varying residual tree densities, unthinned patches, and brush piles, it was very difficult to maneuver equipment, administer the contract, and still meet the objectives of the prescription. A standard thinning prescription (more uniform spacing) would have been much easier to administer and more economical especially in a first time thinning.
- Silviculture/Vegetation --Residual basal area was 90-120 sq ft; it could have been lower in some areas to reach the objective of 60 sq. ft. There was good hardwood diversity and gaps with aspen regeneration. Residual trees were healthy and the “plantation look” was not evident due to the varying densities and spacing between trees. Post harvest treatments include planting of conifer for species and age diversity, but KV funds are not available to do that work and appropriated funds are limited. It was recognized and noted in the Decision Notice that funds may be limited and not all the post harvest activities, which included planting for diversity, would be possible.
- Wildlife –Legacy patches are not needed in commercial thinning harvests. Numbers of green tree residuals were adequate. There was good retention of larger diameter red pine and a good blend of other tree species. Stand is lacking 6-12 snags per acre; generally adequate numbers of snags are lacking prior to harvest. However, there is a potential for future snags with the number of shorter lived residual trees in unit. Spruce trees were retained and brush piles were created for lynx habitat. The effectiveness of the brush piles was discussed in the context of actually being able to create good, usable habitat niches. Harvest under frozen ground was done to protect potential sensitive plant species

because TES surveys had not been done. Potential for TES presence was low due to past regeneration harvest activities in the stand. If funds were available, creation of snags and down woody debris would be beneficial.

- Wetlands/riparian— Boundary of the cutting unit was placed to avoid the RMZ. There were no vernal pools within the stand. Consequently, there was no soil disturbance, water body crossings, or slash in waterbodies. The RMZ outside the unit has long-lived and older species and adequate coarse woody debris (minimum of 5/acre greater than 8 inches diameter).
- Soils – Area consisting of skid trails and landings is within the percentage guidelines (10-15% and 1-3%, respectively). No soil compaction, rutting or erosion noted except on skid trails and landings. Coarse woody debris (2-5 logs greater than 12 inches diameter) generally lacking but larger diameter trees are limited in this stand due to its age. Obliteration of temporary road through slash and stump/root placement was effective. Placement of stumps/roots across the entrance effectively closed the road; there were no indications of recent vehicle use.
- In summary, activities corresponded to those specified in the EA. Forest Plan objectives, standards and guidelines for the most part have been met. Snags were limited in number as was larger diameter coarse woody debris in some places. Recruitment opportunities occur as portions of the overstory die and/or fall to the ground.

Evaluation and Conclusions:

- Overall, district personnel did a good job of implementing prescriptions, design features, mitigation measures, BMPs, and activities as planned in the EA.
- Silvicultural prescriptions were generally implemented as written and appropriate to achieve the desired future conditions for the stands. Objectives for species composition and densities were met. There was little or no damage to residual trees during harvest operations. In some cases dense understory conditions will make planting difficult. In other areas, planting for species diversity is limited by lack of funds.
- Mitigation for wildlife was implemented and effective. Legacy patches, adequate numbers of green reserve trees, and other species for diversity were left. Forage resources were left and available for black-backed woodpecker. Road obliteration should benefit Blanding's turtle. Sufficient numbers of snags generally occurred in the regeneration units but were limited in the thinning units. Snags found in stands prior to harvest are typically retained and are not removed during harvest. To achieve adequate numbers would require funding to create snags. In the thinning units, as reserve trees die, snags will be recruited. Mitigation for TES species was implemented and effective.
- Coarse woody debris was adequate although larger diameter material was limited on some sites. It appears that coarse woody debris was retained on site if it was present before harvest.

- The creation of small slash piles for lynx habitat was questioned. The practice appears to be included any time treatments occur within lynx habitat. More discretion needs to occur to determine where and when pile creation is most appropriate.
- Harvest activities were conducted within the seasonal restrictions for all four units.
- There was little or no evidence of rutting or compaction. Soils were well protected.
- Sale design features and mitigation for riparian/wetlands were implemented and effective.
- Temporary roads were effectively closed by scattering slash or root wad placement.
- Winter logging and cleaning equipment has minimized non-native invasive species introduction and spread, although concentrations of thistle and spread of clover from roadsides is evident.

Summary Recommendations:

- Treatments designed by planning teams can create difficulties for sale administrations. Better communication and understanding between planning teams and implementation teams may result in more economical and easier to implement projects.
- Availability of funding to accomplish post harvest activities needs to be more closely considered if projects are to meet all the objectives identified in their EAs. An example is lack of funding for species diversity planting.
- Site monitoring for non-native invasive species should occur for several years to determine trends, if any, associated with high woody debris loads and bare mineral soil.
- The creation of small slash piles for lynx habitat appears to be included any time treatments occur within lynx habitat. More discretion needs to occur to determine where and when pile creation is most appropriate.

III. RESEARCH AND STUDIES

1. Elm Restoration Project

The Chippewa National Forest initiated a project in 2007 to restore the American elm to the Forest's landscape. Due to Dutch Elm Disease (DED), the American elm component of hardwood forests and riparian ecosystems on the Forest has been greatly reduced or eliminated. The ecological significance of this reduced role of American elm in riparian ecosystems is exacerbated by the pending threat of Emerald Ash Borer.

Over time, a few American elm cultivars possessing natural tolerance to DED have been identified and reproduced. These few known DED tolerant cultivars, which represent a narrow genetic base, are being widely planted in urban areas. Since these cultivars are all from latitudes considerably south of the Forest, concerns over cold-hardiness prevent us from depending on these cultivars to successfully re-establish American elm in northern Minnesota.

In addition to concerns about cold-hardiness, we recognize that there is continuous pressure on the DED fungus to mutate, and a form may eventually develop that can overcome the defenses of these now-tolerant cultivars. The wild landscape has a broad genetic base, and 'survivor' elms may have some level of tolerance to DED. In addition, the wild trees are free to regenerate, which allows natural selection to occur in the American elm species, providing an opportunity for it to adapt to changes in the disease. The objective of this project is to strengthen the tolerance to DED in the landscape of the Chippewa National Forest without narrowing the genetic base of the remaining elm population.

With a two-phase approach, we intend to combine the DED tolerance of existing elm cultivars with the cold-hardiness and genetic diversity of local American elm populations. It is hoped this effort will hasten the process of natural selection for resistance, and a return of the American elm component in the landscape of the Chippewa National Forest. In Phase I, seedlings will be obtained from crosses of local American elm trees with DED tolerant American elm cultivars. These progeny will be tested for DED tolerance and evaluated for cold hardiness. In phase II, clonal progeny from the cold hardy trees that carry DED tolerance will be established in areas where the trees can naturally regenerate and spread.

Partners with the Chippewa National Forest in this effort are Northern Research Station, Delaware, OH; Northern Research Station, Grand Rapids, MN; State & Private Forestry, St. Paul, MN; Region 9 of the US Forest Service, Milwaukee, WI; State of Minnesota, and Leech Lake Band of Ojibwe.

Details on the project

During the summer of 2007, known large living "wild" American elms on the Forest were evaluated and four of these "survivor elms" were selected to use in crosses. These trees are

currently identified as CAE 1, CAE 2, CAE 3, and CAE 4. A team of biologists and silviculturists selected a planting site on each district of the Forest, for a total of 3 sites. These sites are at least one acre in size and are located in natural plant communities where American elm occurred historically.

During February 2008, branch material from CAE 1, CAE 2, CAE3 and CAE 4 will be collected and sent to the Northern Research Station in Delaware, Ohio. There the branches will be forced into bloom and then cross pollinated with trees known to possess high tolerance to DED. The seed produced from these crosses will be sown and grown. Some of the resulting seedlings should possess both cold hardiness and disease tolerance characteristics. In total, we expect to produce 1080 trees, as follows:

Valley Forge x Chippewa American elm (CAE) 1	90 progeny trees
Princeton x CAE 1	90 progeny trees
Valley Forge x CAE 2	90 progeny trees
Princeton x CAE 2	90 progeny trees
Valley Forge x CAE 3	90 progeny trees
Princeton x CAE 3	90 progeny trees
Valley Forge x CAE 4	90 progeny trees
Princeton x CAE 4	90 progeny trees
Valley Forge (a seedling from a 1975 chemical study)	90 trees
Princeton (a 1922 selection by Princeton Nurseries)	90 trees
Am 57845 (a randomly selected clone sensitive to DED)	90 trees
Unselected Chippewa American elm seedlings	90 trees

During the summer of 2008, the three selected sites on the Forest will be prepared for planting the following spring.

In the Spring of 2009, seedlings will be shipped from Northern Research Station in Delaware, Ohio, to the Chippewa NF where they will be out planted. The trees will be planted on each site in 6 randomized blocks with 10 foot spacing. Each block will contain 5 trees of each selection/cross, for a total of 360 trees per site. Each test plot will be fenced to prevent deer browse and deer antler rub. Competing vegetation will be controlled, and trees will be fertilized during years 1-4 and watered during years the 1 and 2 if necessary.

Individual tree growth and condition will be monitored annually. When trees have attained an adequate size (probably spring of the 6th year), they will be tested for DED tolerance. This will be done by placing 150 µls of an aqueous suspension containing approximately 4×10^6 *Ophiostoma novo-ulmi* and *O. ulmi* spores into holes drilled into trunks of the test trees at approximately 4 feet above ground level. The fungal isolates used for this will be obtained from the Chippewa National Forest. Four weeks after inoculation, foliar symptoms (leaf wilting and foliage death) will be recorded, and % crown dieback will be evaluated once a year for the duration of the study.

The second phase of the project will use trees identified as DED tolerant for establishment on the Forest. At this stage we will clonally propagate the progeny trees with the highest levels of DED tolerance for further testing and for outplanting to selected areas of the forest. We will also

maintain and utilize the surviving DED resistant and cold hardy American elms from the Phase I test as a seed orchard for reforestation on the Chippewa and vicinity.

Contact: Gary Swanson, Forest Silviculturist, Chippewa National Forest. 218-335-8652

2. Goblin Fern (*Botrychium Marmo*)

Goblin fern, *Botrychium Marmo*, is a small species of moonwort found in rich hardwood forests in the northern portions of Minnesota. It is a Regional Forester Sensitive Species for Region 9. The "Conservation Approach for Goblin fern, *Botrychium Marmo*", W.H. Wagoner was completed December 2001.

One of the information needs identified for the Goblin Fern was to investigate the response of this species to changes in overstory vegetation and winter logging as would occur in some typical forest management practices. One of the known colonies of goblin fern on the Forest was chosen. The site selected for this study is south of Lower Sucker Lake (Township 144 North, Range 30 West, Section 3), where goblin fern colonies occur on either side of Forest Road 2135. The colony on the west side of the road (14 acres) was chosen as a control and the east side (17 acres) was chosen for treatment of a typical hardwood management practice.

Data collection began in 1995 when both the control and treatment stands were extensively searched for goblin ferns and each plant location was marked. Plots were established to include five or more individual goblin ferns representing sub-samples of the population. Plot data collection has continued annually through 2007. Soil moisture measurements were added to the data collection in 1999 and has continued annually in conjunction with monitoring of the goblin fern population.

A timber harvest contract was awarded to implement the treatment. About 1/3 of the treatment stand was harvested early in 2006, but operations were suspended due to excessive soil disturbance. The remainder of the treatment was completed by the end of February 2007 under adequate conditions for soil frost (>4" in depth) but less than the prescribed 12" of snow depth. A total of 377 trees were removed during the harvest including paper birch, yellow birch, balsam fir, black ash, basswood, and sugar maple species. This resulted in approximately 70% crown closure throughout the managed stand.

Post-treatment plot data collection began during the 2007 growing season and is expected to continue for at least one additional season depending on the extent of the response and confidence in the results.

Monitoring Results:

Table 21 displays the mean annual goblin fern population within the monitoring plots by year for the treatment and control stands. No statistical analysis has been completed on the population monitoring or the soil moisture data. The total count of 27 individuals in the treatment stand following the completion of harvest in 2007 is within the range observed since 2000.

Table 21. Goblin Fern Administrative Study annual count of individual plants within sampling plots summed by year.

	Year												
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Control (n=11)	104	273	117	39	36	27	34	37	30	44	22	22	19
Treatment (n=10)	97	239	101	53	58	36	33	25	15	28	15	29	27

Table 22 displays the mean annual soil moisture for the treatment and control stands. Drought conditions existed during the summers of 2006 and 2007. This is reflected in the lower soil moisture readings taken during those years relative to years prior to 2006.

Table 22. Goblin Fern Administrative Study yearly Average Volumetric Soil Moisture within sample plots.

	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Control site average (n=11)	32.5	37.5	(no data)	27.0	23.9	27.5	26.8	21.3	21.0
Treatment site average (n=10)	31.9	33.4	(no data)	29.9	28.0	27.8	27.5	23.0	23.3

The soil moisture in the treatment site has exceeded the control site in all years since 2002. The goblin fern population in the treatment and control sites has been variable in these same years.

In-depth statistical analysis will occur following the conclusion of the post-treatment monitoring and will be presented in a final report in 2009.

Additional Work Planned or Needed:

Goblin fern counts and soil moisture readings will be taken in 2008 and 2009. Canopy closure measurements are needed in the treatment and control stands to determine actual canopy closure. This is especially needed in the treatment stand, where it is unknown what the actual canopy closure is following the harvest treatment.

Goblin Fern Monitoring Results from Pipeline Study:

The Chippewa National Forest requested that *Botrychium* (moonworts) be transplanted and monitored to determine the impact on moonworts associated with the expansion of the Enbridge Energy – Terrace III Pipeline Expansion Project. Plants were transplanted in 2002. Monitoring the impact of transplanting, soil segregation and loss of shade were components of the study conducted for five years (2003-2007) following the disturbance. Cindy Johnson-Groh, PhD, Gustavus Adolphus College oversaw the study. Monitoring and reports were done annually.

A final report was completed in March 2008. Information contained in that report includes:

- Since 2002 the populations in all the plots have decreased. (p. 3)
- While it is still difficult to draw any conclusions from the trends in these populations, a downward trend seems to be emerging. Based on previous research on other mid-western *Botrychium* we know that populations vary considerably between populations and between years both in numbers and in size (Johnson-Groh 2003b). It is possible that the overall decline can be attributed to the disturbance caused by pipeline construction. But it is also possible that the overall decline is due to normal variation or a combination of variation and soil moisture. (p.8)
- Recruitment of new individuals was high in 2004 and 2005 but then dropped significantly in 2006 and 2007. This may indicate a decline in the population, but it is difficult to tell without additional years of monitoring. (p. 9)
- Drought may have affected the populations in 2006 and 2007. (p. 10)
- Because moonwort life cycles span years to decades it is not possible to determine if the transplants, shade loss and partial shade loss treatments were successful or not. Additional years of monitoring are necessary to ascertain this. Based on the downward trends one could conclude that these treatments were unsuccessful which may be true, however it is premature to conclude this given the long life span of moonworts, the great variability in annual populations and the ability to remain dormant below ground for many years. (p.11)

3. Red Pine Retention Study (RPR)

North Central Research Station is conducting this study in cooperation with the Chippewa National Forest and University of Minnesota. The study area is located in the Tamarack Point area on the Deer River District which is administered by District Ranger, Joseph Alexander. Since its implementation, this project has gained national and international recognition and interest.

In currently managed, naturally regenerated and planted red pine stands, there is minimal variation in structure and composition relative to historic conditions. The study is designed to create red pine stands that more closely represent past ecosystems. This study uses partial harvests to reduce stands to the same basal areas but leaves remaining overstory trees in different spatial patterns on the landscape. The patterns include large gaps, small gaps, and traditional, evenly spaced thinning. Jack, red and eastern white pine were planted in the understory to increase structure and composition. The varying spatial patterns and densities of the overstory will be compared to the effects on growth and survival of regeneration, understory composition, site productivity, avian communities and disease incidence.

Results will be monitored for 5+ years after treatment. Logging began in August 2002 and was completed in April 2003. Planting was done in May 2003. Data collection began in 2003 and is planned for a number of years. Data is being collected on the following: planted seedling

survival, seedling layer, herbaceous vegetation, litterfall, newly recruited mature treefall, resource heterogeneity, resource competition and seedling growth, pathology, carbon isotopes. Avian surveys are also being conducted. Preliminary results are not yet available. Researchers have hosted several field trips to the site to discuss the study objectives, methodology, and data collection.

The Big Lake Management Plan Environmental Assessment covered this study (1999). The establishment report and study Plan is *Restoring Stand Complexity in Managed Red Pine (Pinus resinosa) Ecosystems Using Overstory Retention and Understory Control*, (Palik, Zasada, and Kern, 2003). The design and implementation of the project has involved the expertise and commitment of numerous resource professionals on the Chippewa Forest, especially on the Deer River and Blackduck Districts, and from Northern Research Station, University of Minnesota, Michigan Tech University, Iowa State University, and State and Private Forestry. It continues to draw the attention and interest of researchers and natural resource professionals across the country and even internationally.

Contact: Brian Palik, Northern Research Station, 218-326-7116

Blueberry management:

Both the Native communities and the Forest Service have shown concern for the restoration of blueberry to the landscape. The ongoing Red Pine Retention Study offers some insights to the management of blueberry in silvicultural systems. During 2007, Mike Reinikainen looked at blueberry management on Tamarack Point and compiled his research in *Blueberry Management in North Central Minnesota Red Pine (Pinus resinosa) Dominated Silvicultural Systems*. The following information is contained in his paper.

Vaccinium demographics from the Red Pine Retention Study suggest that blueberry production can be increased on the fire dependent red pine forest landtype which occurs on sandy and gravelly soils. Two species of blueberry -- *Vaccinium angustifolium* (VAAN) and *Vaccinium myrtilloides* (VAMY) were studied.

Findings from the RPR study answer the question: Which treatment within this study seems to best benefit blueberry production? The beneficial treatment is that which provides an appropriate balance of light and thermal cover while maintaining adequate soil moisture. Of the four treatments examined, the dispersed thin seems to be the best silvicultural option as far as Lake State blueberry management is concerned.

Both *Vaccinium spp.* responded favorably to the dispersed thin treatment, but when examined separately, each species responded differently to the gap treatments. The gap areas of the large gap treatment while advantageous to VAAN percent cover, caused treatment wide VAMY percent cover declines. Interestingly, VAMY rate of decline was smallest in the forested area. Again, VAMY and VAAN tend to inhabit certain niches (Maillette 1988); an idea that is important when managing for species diversity. Providing appropriate cover for both species is necessary, and the dispersed thin treatment seems to be a compromise between VAAN and VAMY habitat preferences.

Rate of decline for *Vaccinium spp.* density was the least (2%/year) in the dispersed thin treatment. By 2006, *Vaccinium spp.* density in the dispersed thin was considerably greater than the other overstory treatments, and 2006 values were closest to pre-harvest stem densities. The dispersed thin was also the only treatment where *Vaccinium spp.* cover seemed to increase. Past pine thinning studies documented a similar response (Hall 1964). This is attributed to the rhizomatous nature of *Vaccinium spp.* and its ability to expand into gaps of light.

Timber harvests in 2002 opened canopies and greatly increased available light to blueberry plants. The stem density decline and the stability of percent cover suggest increased vigor among remaining plants, but vigor decreases with age. An average age was not established for *Vaccinium* populations in the study, but it can be assumed due to the clonal nature of blueberry that the majority of plants are more than 4 to 5 years old. Any plants that established following the 2002 harvest are passing the 4 to 5 year production peak. Because highest flower bud production and subsequent fruiting is found on twigs that are 1-5 years old (Shubat 1983), fires affect on berry production cannot be ignored.

Increased plant vigor is necessary to sustain and propagate a *Vaccinium* population with fire (Hall 1955). When managing for timber as well as blueberry production, fire should not be implemented immediately following a harvest. Burning one growing season after a harvest allows smaller shade grown *Vaccinium* plants to increase root system carbohydrate stores before the trauma of a fire.

Hazel (*Corylus spp.*) further complicates the management of blueberry populations. It is a resilient rhizomatous species that persists in the absence of frequent low severity fires or the infrequent high severity fires associated with dry summer conditions (Buckman 1964). The RPR study has effectively lowered the density and biomass of *Corylus spp.* in the shrub layer of their brushing treatments, but density has increased in the lower seedling stratum (Kern 2005). This demonstrates that despite mechanical control *Corylus spp.* sprouts can have an impact on light availability as *Corylus spp.* density increases in the forest stratum occupied by *Vaccinium spp.* Thus, blueberry declines in the understory release treatment of the RPR study emphasize the importance of controlling nuisance *Corylus spp.* populations with fire.

There is potential to increase berry production on the Chippewa. In addition to the red pine land type, blueberry yield in the *Jack Pine (PIBA) Forest* can be quite high during stand initiation following severe crown fires. Although these fire events are no longer as frequent as they were historically, silvicultural treatments can be used as analogs to benefit blueberry production. Seed bed preparation for jack pine regeneration following clearcuts mimics natural stand initiation; a point in succession where VAAN often flourishes (Hall 1955; Reynolds-Hogland 2006). It goes without saying that this technique would meet another management objective: reinvigorating decadent jack pine stands. Similar to gap formation in red pine stands, VAAN also does well in decadent jack pine stands where insolation is high due to a sparse canopy.

4. Long-Term Soil Productivity Study

As part of a national long-term soil productivity study, soil porosity and organic matter are being experimentally manipulated on large plots to determine the impacts of such manipulation on growth and species diversity of aspen stands on the Chippewa National Forest.

Research was done in two areas on the Chippewa National Forest. The first study area is on the Marcell Experimental Forest on the Marcell Moraine Landtype Association and it was started in 1991. The second study area is called the Chippewa site and that is located within the Guthrie Till Plain Landtype Association. That treatment began in 1993. Test plots were prepared to determine the effects of soil compaction and organic matter removal on soil properties and growth of aspen suckers; along with associated species and herbaceous vegetation on stand development. On the Marcell and Chippewa sites the study involved winter harvest of 70 year-old aspen growing on loamy soils.

The following combinations of treatments were applied to the sites:

- 1) Whole tree harvest (trees lifted off the site with little or no ground disturbance from machinery) or bole only removal.
- 2) No soil compaction, moderate compaction or heavy compaction.
- 3) Forest floor removal or no forest floor removal

The 15th year sampling was completed in 2005 and 2006 for the Marcell pilot study site. The vegetation was sampled for the 15th year at the Chippewa site in 2007 and the soil will be sampled in 2008. The University of Minnesota will record the plant species in 2009 at the Chippewa site.

Northern Research Station located in Grand Rapids, Minnesota hired a post-doctoral researcher, Rick Voldseth, to summarize the 10-year data. In September 2006, Rick presented his preliminary findings during an office presentation and field tour to the Chippewa National Forest and other interested agencies. His final report is expected to be released in April, 2008.

Contact: Jim Barott, Forest Soils Scientist, Chippewa National Forest. 218-335-8685.

5. Soil Compaction Monitoring

Aaron Steber, a graduate student from the University of Minnesota - St. Paul, conducted a study to observe the degree of soil compaction from recently harvested timber on selected sites within the Chippewa National Forest. His research was funded by a study to look at methods to sample soils at FIA plots. Half of the sites were on loamy, fine-textured soils and half were on sandy, coarse textured sites. In 2004, Aaron looked at the relationship of soil compaction and soil texture. In 2005, he looked at the relationship of soil compaction and landscape features. Results suggest that heavier textured soils are more susceptible to compaction and using only visual criteria for determining soil compaction may not relate to the actual degree of compaction on the site.

Aaron summarized the results of his research in a paper, Surface Compaction Estimates and Soil Sensitivity in Aspen Stands of the Great Lake States. In March 2007, Charles Perry presented a summary of Aaron's work at the Wisconsin Society of American Foresters Conference.

Contact: Jim Barott, Forest Soils Scientist, Chippewa National Forest. 218-335-8685.

6. Releve Vegetation Monitoring

Arrangements were made with Bemidji State University graduate student, Jeanne Ring, and her advisor, Mark Fulton to re-sample vegetation on permanent 10 X 10 meter releve plots within the Chippewa National Forest. During the 2006 field season, Jeanne collected data from 18 plots.

Objectives for the monitoring included:

- To evaluate the vegetation / soil effects of different harvesting techniques.
- To observe successional pathways – without disturbance.
- To observe successional pathways with different types of disturbance.
- Use the information about the successional pathways and vegetation dynamics in the Terrestrial Ecological Unit interpretations.
- To monitor the effects of noxious weeds, earthworms or other invasive species.
- To establish productivity ratings for ecological units.

Professor Mark Fulton will release a summary of the findings in September 2008.

Contact: Jim Barott, Forest Soils Scientist, Chippewa National Forest. 218-335-8685.

7. Monitoring by the Minnesota Dept. of Natural Resources and the Minnesota Forest Resources Council

There was no site-level forest management guideline monitoring done by the Minnesota DNR on the Chippewa National Forest in 2007. None will be done in 2008; however, it is expected that monitoring will resume in 2009.

IV. ADJUSTMENTS OR CORRECTIONS, AND AMENDMENTS TO THE FOREST PLAN

Since the Chippewa National Forest Land and Resource Management Plan (Forest Plan) was revised, Congress has enacted the 2000 Planning Rule which allows us to make non-substantive corrections or adjustments to the revised Forest Plan using a process called “administrative corrections”. Administrative corrections (36 CFR 219.7(b)) may be made at any time and are not plan amendments or revisions. Administrative corrections include the following:

- (1) Corrections and updates of data and maps,
- (2) Corrections of typographical errors or other non-substantive changes;
- (3) Changes in the monitoring program and monitoring information
- (4) Changes in timber management projections; and
- (5) Other changes in the Plan Document or Set of Documents, except for substantive changes in the plan components.

In FY 2007 there was one administrative correction – Change to Proposed and Probable Practices, Administrative Correction 9 (9/14/2007). On Sept 5, 2007, Forest Supervisor Robert Harper signed a Supplemental Information Report (SIR) Disclosing the Effects on Analysis Disclosed in the Final Environmental Impact Statement for the 2004 Chippewa National Forest Land and Resource Management Plan of Thinning Harvests that Exceed the Amount of Thinning Estimated for Decade 1 of Forest Plan Implementation. The results of that SIR demonstrated to the Forest Supervisor that an administrative correction to Table APP-D2 of the Forest Plan constituted a non-substantial change and was consistent with the 2000 Planning Rule.

Table APP D-2 is corrected to increase the acres and percentage of thinning treatments and to reduce the acres and percentage of uneven-aged treatment in red pine, white pine, spruce fir, and northern hardwood, oak and black ash in Decade 1. Total acres treated are unchanged. The corrected table is as follows:

Table APP-D2: Estimate of acres of timber harvest by treatment method (Forest Wide)

Treatment Method	Decade 1 (proposed)		Decade 2 (probable)	
	Acres	Percent	Acres	Percent
Thinning	16,000	21%	11,578	14%
Clearcutting	29,866	39%	30,881	38%
Shelterwood & Partial Cut 30	11,149	14%	11,101	14%
Uneven-aged (red pine, white, pine, spruce fir, northern hardwood, oak, black ash)	10,273	13%	22,742	28%
Uneven-aged (aspen-aspen/fir)	9,851	13%	5,920	7%
TOTALS	77,139	100%	82,222	100%

There were no administrative corrections made during FY 2006. During FY 2005, there were seven corrective changes. We will likely issue additional administrative corrections in the future.

There has been one non-significant amendment to the revised Forest Plan. The CNF Land and Resource Management Plan (Forest Plan) has been amended as follows:

The wording of the G-ORV-1 guideline was changed to the following:

- **ORV use is prohibited on OML 3, 4, and 5 roads, except where they have been designated as open for ORV use through site-specific analysis.**

This changes the wording from the previous G-ORV-1 guideline:

- G-ORV-1: ORV use is generally prohibited on OML 3, 4, and 5 roads (Forest Plan, p 2-43).

This amendment was part of the Off-Highway Vehicle Road Travel Access Project Decision Notice and Finding of No Significant Impact signed by Forest Supervisor, Robert M Harper on November 15, 2007. The analysis for this decision is documented in the Off-Highway Vehicle Road Travel Access Project Environmental Assessment.

The amendment, full corrections, as well as the corrected pages from the set of Plan documents can be found at: http://www.fs.fed.us/r9/forests/chippewa/projects/forest_plan/index.php. We encourage people to use this resource for accessing the most up to date information on amendments and administrative corrections. Future corrections or amendments will also be listed in the Chippewa NF *Schedule of Proposed Actions* which is distributed quarterly. We will continue to provide opportunity for public involvement at the project level and during any substantive changes to the Forest Plan.

V. LIST OF PREPARERS

The following people collected, evaluated, or contributed time and/or data for the FY 2007 Monitoring and Evaluation Report.

Name	Discipline
Brenda Halter-Glenn	Forest Planner
Sharon Klinkhammer	Forest NEPA Coordinator/ Planner
Gary Swanson	Forest Silviculturist
Cindy Miller	Timber Specialist
Millie Baird	Engineer
Lori Larson	Timber Resource Specialist
Andrea LeVasseur	Archaeologist
Bill Yourd	Archaeologist
Neil Peterson	Tribal Liaison
Jim Barott	Soils Scientist
Mary Nordeen	Public Affairs Specialist
Ann Long-Voelkner	Recreation Planner
Leo Johnson	Blackduck NEPA Coordinator
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Donna Schackman	Hydro Technician
Jim Gallagher	Walker District Wildlife Biologist
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Eriko Onuma	BSU Environmental Studies Graduate Student
Greg Smith	Forest Realty Specialist
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